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Clark University
in the City of Worcester
Massachusetts

Register and Twenty-fifth Official Announcement

1913

CLARK UNIVERSITY

WORCESTER, MASSACHUSETTS

REGISTER AND TWENTY-FIFTH OFFICIAL ANNOUNCEMENT

WORCESTER, MASSACHUSETTS
Published for the University
February, 1913

BOARD OF TRUSTEES

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Buildings

Orlando W. Norcross

CALENDAR 1913–1914

1913		
FEB. 1	Saturday	Founder's Day*
FEB. 22	Saturday	Washington's Birthday
APRIL 7	Monday	Spring Recess
APRIL 12	Saturday	
APRIL 19	Saturday	Patriots' Day
MAY 30	Friday	Memorial Day
JUNE 17	Tuesday	Twenty-fourth academic year closes

Summer Vacation of 14 Weeks

SEPT. 25	Thursday	Twenty-fifth academic year begins
OCT. 13	Monday	Columbus Day
NOV. 27	Thursday	Thanksgiving Day
DEC. 24	Wednesday	Christmas Recess
1914		
JAN. 3	Saturday	
FEB. 2	Monday	Founder's Day*
FEB. 23	Monday	Washington's Birthday
APRIL 6	Monday	Spring Recess
APRIL 11	Saturday	
APRIL 20	Monday	Patriots' Day
MAY 30	Saturday	Memorial Day
JUNE 16	Tuesday	Twenty-fifth academic year closes

*Not a holiday

MEMBERS

STAFF

GRANVILLE STANLEY HALL, PH.D., LL.D. 156 Woodland St.
President of the University and Professor of Psychology

A.B., Williams College, 1867; A.M., 1870; Ph.D., Harvard University, 1878; Lecturer in Harvard and Williams Colleges, 1880–81; Professor of Psychology, Johns Hopkins University, 1881–88; President and Professor of Psychology, Clark University, 1888–; LL.D., University of Michigan, 1888, Williams College, 1889, and Johns Hopkins University, 1902; Chairman of the Library Committee and Curator of the Art Collection, Clark University. Resident Member of the Massachusetts Historical Society.

WILLIAM EDWARD STORY, PH.D. 17 Hammond St.
Professor of Mathematics and Secretary of the Faculty

A.B., Harvard University, 1871; Ph.D., University of Leipzig, 1875; Parker Fellow (Harvard), 1874–75; Tutor of Mathematics, Harvard University, 1875–76; Associate, Assistant Professor, and Associate Professor of Mathematics, Johns Hopkins University, 1876–89; Professor of Mathematics, Clark University, 1889–; Professor of Mathematics, Clark College, 1902–07. Member of the National Academy of Sciences; Member of the London Mathematical Society; Resident Fellow of the American Academy of Arts and Sciences.

EDMUND CLARK SANFORD, PH.D., SC.D., LL.D.
Lecturer on College Administration 160 Woodland St.

A.B., University of California, 1883; Fellow, Johns Hopkins University, 1887; Ph.D., Johns Hopkins University, 1888; Instructor in Psychology, Johns Hopkins University, 1888; Instructor in Psychology, Clark University, 1889-92; Assistant Professor, 1892–1900; Professor of Psychology, Clark College, 1903–07; Professor of Experimental and Comparative Psychology, Clark University, 1900–09; Lecturer, 1909–; Sc.D , Hobart College, 1909; President of Clark College, 1909–; LL.D., University of California, 1912.

ARTHUR GORDON WEBSTER, PH.D., SC.D., LL.D.
Professor of Physics 66 West St.

A.B., Harvard University, 1885; Instructor in Mathematics, Harvard University, 1885–86; Parker Fellow, 1886–89; Student, Universities of Berlin, Paris, Stockholm, 1886–90; Ph.D., University of Berlin, 1890; Docent in Physics, Clark University, 1890–92; Assistant Professor, 1892–1900; Professor, 1900–; Professor of Physics, Clark

College, 1902–07; Director of Physical Laboratories; Sc.D., Tufts College, 1905; LL.D., Hobart College, 1908. Member of the National Academy of Sciences; Resident Fellow of the American Academy of Arts and Sciences; Member of the American Philosophical Society.

HENRY TABER, PH.D.
Professor of Mathematics — 65 West St.

Ph.B., Yale University, 1882; Ph.D., Johns Hopkins University, 1888; Assistant in Mathematics, Johns Hopkins University, 1888–89; Docent in Mathematics, Clark University, 1889–92; Assistant Professor, 1892–1903; Professor, 1903–; Member of the London Mathematical Society; Resident Fellow of the American Academy of Arts and Sciences.

CLIFTON FREMONT HODGE, PH.D.
Professor of Biology — 103 May St.

A.B., Ripon College, 1882; Fellow in Biology, Johns Hopkins University, 1888–89; Ph.D., Johns Hopkins University, 1889; Fellow in Psychology and Assistant in Neurology, Clark University, 1889–91; Instructor in Biology, University of Wisconsin, 1891–92; Assistant Professor of Physiology and Neurology, Clark University, 1891–1906; Professor of Biology, 1906–; Professor of Biology, Clark College, 1902–.

WILLIAM HENRY BURNHAM, PH.D.
Professor of Pedagogy and School Hygiene — 17 Circuit Ave.

A.B., Harvard University, 1882; Instructor in Wittenberg College, 1882–83; Instructor, State Normal School, Potsdam, N. Y., 1883–85; Fellow, Johns Hopkins University, 1885–86; Ph.D., 1888; Instructor in Psychology, 1888–89; Docent in Pedagogy, Clark University, 1890–92; Instructor, 1892–1900; Assistant Professor, 1900–06; Professor, 1906–.

ALEXANDER FRANCIS CHAMBERLAIN, PH.D.
Professor of Anthropology — 19 Baker St.

B.A., University of Toronto, 1886; M.A., 1889; Fellow in Modern Languages, University College, Toronto, 1887–90; Librarian, Canadian Institute, Toronto, 1889–90; Fellow in Anthropology, Clark University, 1890–92; Ph.D., Clark University, 1892; Lecturer in Anthropology, Clark University, 1892–1900; Acting Assistant Professor, 1900–04; Assistant Professor, 1904–11; Professor, 1911–; Editor, *Journal of American Folk-Lore*, 1900–1907; Co-editor, *Journal of Religious Psychology*, 1911–; Corresponding Member O Instituto de Coimbra, Portugal; Member of the American Antiquarian Society; Honorary Member American Folk-Lore Society; Fellow American Ethnological Society; Contributor to *Encyclopedia Britannica* (11th Ed.).

MARTIN ANDRE ROSANOFF, SC.D.
Professor of Chemistry — 7 Downing St.

Ph.B., New York University, 1895; Sc.D., 1908; Student, University of Berlin, 1895–96; University of Paris, 1896–98; Research Fellow, New York University, 1899–1900; Instructor in Theoretical Chemistry, New York University, 1904–05; Assist-

ant Professor of Chemistry, 1905–07; Assistant Professor of Chemistry, Clark University, 1907–11; Professor, 1911–; Assistant Professor of Organic Chemistry, Clark College, 1907–10; Professor, 1910–12; Director of University Chemical Laboratory; Fellow of the American Association for the Advancement of Science; Member of the Royal Society of Arts; Nichols Medalist of the American Chemical Society.

GEORGE HUBBARD BLAKESLEE, PH.D.
Professor of History — 24 Richards St.

A.B., Wesleyan University, 1893; A.M., Harvard University, 1899; Ph.D., 1903; Student, Johns Hopkins University, 1893–94; Parker Fellow, Harvard, 1901–02; Student, Universities of Berlin, Leipzig, and Oxford, 1901–03; Instructor in History, Clark College, 1903–04; Assistant Professor, 1904–09; Professor, 1909–; Instructor in History, Clark University, 1905–11; Professor, 1911–.

JOHN WALLACE BAIRD, PH.D. — 17 Circuit Ave.
Professor of Experimental Psychology

A.B., University of Toronto, 1897; Student, University of Leipzig, 1898–99; Fellow, University of Wisconsin, 1899–1901; Fellow, Cornell University, 1901–02; Ph.D., 1902; Assistant in Psychology, 1902–03; Carnegie Research Assistant, 1903–04; Instructor in Psychology, Johns Hopkins University, 1904–09; Instructor in Psychology, University of Illinois, 1906–07; Assistant Professor, 1907–February, 1910; Assistant Professor of Experimental Psychology, Clark University, February, 1910–February, 1913; Professor, February, 1913–.

JOSEPH DE PEROTT
Lecturer in Mathematics — 5 Hawthorn St.

Student, Universities of Paris and Berlin, 1877–80; Docent in Mathematics, Clark University, 1890–1904; Lecturer, 1904–.

LOUIS N. WILSON, LITT.D. — 11 Shirley St.
Librarian of the University and Custodian of the Art Collection

Litt.D., Tufts College, 1905.

FRANK HAMILTON HANKINS, PH.D.
Instructor in Economics and Sociology — 4 Cabot St.

A.B., Baker University, 1901; Student, Columbia University, 1903–04; Scholar in Sociology, 1904–05; Fellow in Statistics, 1905–06; Student, 1907–08; Ph.D., Columbia University, 1908; Instructor in Economics, Clark College, 1906–07; Assistant Professor, 1908–; Instructor in Economics and Sociology, Clark University, 1906–07; 1908–.

JOHN CHARLES HUBBARD, PH.D.
Instructor in Physics — 8 Loudon St.

B. S., University of Colorado, 1901; Scholar in Physics, Clark University, and Assistant to Professor Webster, 1901–02; Fellow, 1902–04; Ph. D., Clark University, 1904; Instructor in Physics, Simmons College, 1904–05; Asssistant Professor of

Physics, New York University, 1905–06; Assistant Professor of Physics, Clark College, 1906–11; Professor, 1911–; Honorary Fellow in Physics, Clark University, 1907–09; Instructor, 1910–.

FRANK BLAIR WILLIAMS, PH.D.
Instructor in Mathematics — 2 Isabella St.

C.E., University of Missouri, 1890; M. S., 1893; Engineering Work with the Mississippi River Commission, 1890–92; Teaching Fellow in Mathematics, University of Missouri, 1892–93; Survey Work with the Mississipi River Commission, 1894–95; United States Assistant Engineer in Tennessee River Improvement, 1895–97; Scholar in Mathematics, Clark University, 1897–98; Fellow, 1898–1900; Ph.D., 1900; Assistant Professor of Civil Engineering, Union College, 1900–05; Assistant Professor of Engineering and Mathematics, 1905–06; Professor of Engineering Mathematics, 1906–07; Assistant Professor of Mathematics, Clark College, 1907–08; Professor, 1908–; Honorary Fellow in Mathematics, Clark University, 1909–10; Instructor, 1910–.

ANNUAL APPOINTMENTS

EDWARD COWLES, M.D., LL.D., Boston
Non-Resident Lecturer in Psychiatry

A.B., Dartmouth College, 1859; A.M., 1863; Medical House Pupil, Retreat for the Insane, Hartford, Conn., 1860–62; M.D., Dartmouth Medical School, 1863; M.D., College of Physicians and Surgeons, New York, 1863; Medical Corps, United States Army, 1863–72; Resident Physician and Superintendent, Boston City Hospital, 1872–79; Medical Superintendent, McLean Hospital, Waverley, Mass., 1879–1903; Lecturer on Mental Diseases, Dartmouth Medical School, 1885–86; Professor of Mental Diseases, 1886–; Fellow by Courtesy, Johns Hopkins University, 1887–88; Clinical Instructor in Mental Diseases, Harvard Medical School, 1888–; LL.D., Dartmouth College, 1890; Non-Resident Lecturer in Psychiatry, Clark University, 1903–.

ARTHUR AMOS NOYES, PH.D., SC.D., LL.D., Boston
Non-Resident Lecturer in Chemical Research

S.B., Massachusetts Institute of Technology, 1886; S.M., 1887; Ph.D., University of Leipzig, 1890; Assistant and Instructor in Chemistry, Massachusetts Institute of Technology, 1887–88 and 1890–94; Assistant Professor, 1894–99; Professor and Director of the Research Laboratory of Physical Chemistry, 1899–; Non-Resident Lecturer in Chemical Research, Clark University, 1910–. Member of the National Academy of Sciences.

ROBERT KENNEDY DUNCAN, A.B., Pittsburgh, Pennsylvania
Non-Resident Lecturer in Industrial Chemical Research

A.B., University of Toronto, 1892; Fellow in Chemistry, Clark University, 1892–93; Graduate Student, Columbia University, 1897–98; Professor of Chemistry, Washington and Jefferson College, 1901–06; Professor of Industrial Chemistry,

University of Kansas, 1906–; Director of Industrial Research, 1910–; Professor of Industrial Chemistry and Director of Industrial Research, University of Pittsburgh, 1910–; Non-Resident Lecturer in Industrial Chemical Research, Clark University, 1911–.

SAMUEL PAUL CAPEN, PH.D.

Lecturer on School Administration — 9 Downing St.

A.B., A.M., Tufts College, 1898; A.M., Harvard University, 1900; Ph.D., University of Pennsylvania, 1902; Harrison Fellow in Germanic Languages, University of Pennsylvania, 1900–01; Graduate Student, on leave of absence, 1901–02; Student, University of Leipzig, 1901–02; Instructor in Modern Languages, Clark College, 1902–03; Assistant Professor, 1903–08; Professor, 1908–; Lecturer on School Administration, Clark University, 1911–.

SAMUEL WEILLER FERNBERGER, PH.D.

Instructor in Experimental Psychology — 65 Charlotte St.

B. S., University of Pennsylvania, 1908; M.A., 1909; Ph.D., 1912; Assistant in Psychology, University of Pennsylvania, 1908–09; Instructor, 1910–12.

SAMUEL TORREY ORTON, M.D.

Lecturer in Neurology — Worcester State Hospital

B.S., Ohio State University, 1901; M.D., University of Pennsylvania, 1905; A.M., Harvard University, 1906; Pathological Service, Boston City Hospital, July, 1905–January, 1907; Pathologist, Columbus State Hospital, Columbus, Ohio, 1907; St. Ann's Hospital Laboratory, Anaconda, Montana, 1908–10; Worcester State Hospital, January, 1910–October, 1912; Assistant in Neuropathology, Harvard Medical School, 1910 and 1911; Instructor, 1912; Clinical Director and Pathologist, Worcester State Hospital, October, 1912–.

THEODATE L. SMITH, PH.D. — 23 Maywood St.

Lecturer and Librarian in the Children's Institute

A.B., Smith College, 1882; A.M., 1884; Student, Yale University, 1893–95; Special Student, Clark University, 1895–96; Ph.D.,Yale University. 1896; Cornell University, 1900; Assistant to President Hall in research work under Carnegie grant, Clark University, 1902–04; Estabrook grant, October, 1904–February, 1905; Berlin University, April–August, 1905; Research Assistant to President Hall,Clark University, 1905–09; Lecturer and Librarian in the Children's Institute, 1909–.

AMY ELIZA TANNER, PH.D., Faribault, Minnesota

Research Assistant to President Hall — 90 Florence St.

A.B., University of Michigan, 1893; Scholar, University of Chicago, 1894–95; Fellow, 1895–98; Ph.D., University of Chicago, 1898; Associate in Philosophy, 1898–1902; Professor of Philosophy, Wilson College, 1903–07; Honorary Fellow in Psychology, Clark University, 1907–09; Lecturer in the Children's Institute, 1909–11; Research Assistant to President Hall, 1911–.

RADOSLAV ANDREA TSANOFF, PH.D.

Instructor in Philosophy — 109 Lovell St.

A.B., Oberlin College, 1906; Scholar in Philosophy, Cornell University, 1907–08; Susan Linn Sage Fellow, 1908–10; Ph.D., 1910; engaged in research at Columbia University, 1910–12.

HONORARY FELLOWS

JAMES ATKINS BULLARD, A.B.

Honorary Fellow in Mathematics — 18 Walnut St.

A.B., Williams College, 1908; Instructor in Mathematics, Worcester Polytechnic Institute, 1908–; Student in Mathematics, Clark University, 1908–11: Honorary Fellow, 1911–.

ARTHUR DEXTER BUTTERFIELD, A.M.

Honorary Fellow in Mathematics — 10 Schussler Road

B.S., Worcester Polytechnic Institute, 1893; M.S., 1898; A.M., Columbia University, 1904; Instructor in Civil Engineering, Worcester Polytechnic Institute, 1894–98; Instructor in Mathematics, Engineering Department, University of Vermont, 1898–1900; Assistant Professor, 1900–04; Professor of Mathematics and Mechanics, 1904–08; Assistant Professor of Mathematics, Worcester Polytechnic Institute, 1908–10; Professor, 1910–; Student in Physics and Mathematics, Clark University, 1908–09; Honorary Fellow in Mathematics, 1909–.

ELNORA WHITMAN CURTIS, PH.D.

Honorary Fellow in Psychology — Burncoat St.

A.B., Smith College, 1892; Scholar in Psychology, Clark University, 1907–08; A.M., 1908; Honorary Fellow in Psychology, 1908–; Ph.D., 1910.

IRVING ANGELL FIELD, A.M., Granville, Ohio

Honorary Fellow in Biology — 5 Enfield St.

B.S., Denison University, 1903; Instructor in Ornithology, 1902–03; Assistant in Zoology, Harvard University, 1903–05; Austin Teaching Fellow, 1905–06; Professor of Chemistry and Biology, Western Maryland College, 1906–11; A.M., Harvard University, 1912; Instructor in Biology, Clark College, 1911–; Honorary Fellow in Biology, Clark University, 1911–.

JAMES EDMUND IVES, PH.D.

Honorary Fellow in Physics — 1030 Main St.

Assistant Curator, Academy of Natural Sciences, Philadelphia, 1887–93; Instructor in Physics, Drexel Institute, 1893–97; Jessup Student, Academy of Natural Sciences, Philadelphia, 1887–91; Student in Histology and Embryology, University of Pennsylvania, 1888–89; Student in Mathematics, 1893–95; Student in Physics, Cavendish Laboratory, Cambridge, England, 1896; Scholar in Physics, Clark University, 1897–98; Fellow, 1898–1901; Ph.D., 1901: Instructor in Physics, University of Cincinnati, 1901–03; Assistant Professor, 1905–10; Associate Professor, 1910–12.

KARL JOHAN KARLSON, PH.D., Myresjo, Sweden
Honorary Fellow in Psychology 6 Wyman St.

A.B., Clark College, 1909; Scholar in Psychology, Clark University, 1909–10; A.M., 1910; Fellow, 1910–12; Ph.D., 1912.

JOHN MILTON MCINDOO, PH.D.
Honorary Fellow in Psychology 104 Woodland St.

A.B., Antioch College, 1900; Instructor in English, Antioch College, 1899–1900; Instructor in Psychology and Pedagogy, Chattanooga Normal School, 1900–01; Instructor in Psychology and Pedagogy, Northern Illinois Normal School, 1901–03; Instructor in Pedagogy and English, Junior State Normal School, Broken Bow, Neb., 1906–09; Scholar in Pedagogy, Clark University, 1909–10; A.M., 1910; Fellow, 1910–12; Ph.D., 1912; Honorary Fellow in Psychology, September–December, 1912.

FREDERICK THOMAS MAYER-OAKES, PH.D., Stoughton
Honorary Fellow in Anthropology

A.B., Kansas City University, 1905; A.M., Leander Clark College, 1908; B.D., Kansas City University, 1909; Graduate Student in Anthropology, Yale University, 1909–10; Ph.D., Kansas City University, 1910; Scholar in Anthropology, Clark University, 1910–11; A.M., 1911; Fellow, 1911–12.

CAREY EYSTER MELVILLE, A.B.
Honorary Fellow in Mathematics 3 Ferdinand St.

A.B., Northwestern University, 1901; Fellow in Mathematics, 1901–02; Graduate Student in Mathematics, Johns Hopkins University, 1902–03; Instructor in Mathematics, Case School of Applied Science, 1903–06; Honorary Fellow in Mathematics, Clark University, 1906–; Assistant in Mathematics, Clark College, 1906–09; Instructor, 1909–10; Instructor in Mathematics and Physics, 1910–11; Assistant Professor, 1911–.

FRANK K. SECHRIST, PH.D.
Honorary Fellow in Psychology 46 May St.

Ph.B., Lafayette College, 1892; Professor of English, State Normal School, Lock Haven, Pa., 1892–99; Graduate Student, Lafayette College, 1893–98; Ph.D., 1898; Professor of Psychology and Pedagogy, State Normal School, Lock Haven, Pa., 1899–1900; Professor of English, State Normal School, Stevens Point, Wis., 1900–10; Professor of English and Modern Languages, Rhode Island State College, 1910–12; Graduate Student, Harvard University, 1911.

FELLOWS

ARTHUR KENNEDY BEIK, Ped.M., Wapello, Iowa
Fellow in Pedagogy 104 Woodland St.

Ph.B., Grinnell College, 1908; Ped.M., School of Pedagogy, New York University, 1909; Fellow in Pedagogy, Clark University, 1911–.

RAYMOND BELLAMY, A.B., Moores Hill, Indiana
Fellow in Psychology — 23 King St.

A.B., Moores Hill College, 1910; Professor of Chemistry and Physics, 1910–12.

GEORGE DAVIS BIVIN, A.M.
Fellow in Psychology — 7 Shirley Terrace

A.B., Clark College, 1909; Scholar in Psychology, Clark University, 1909–10; A.M., 1910; Fellow, 1910–.

IVY GERTRUDE CAMPBELL, A.M., Malvern, Iowa
Fellow in Psychology — 15 Lagrange St.

A.B., University of Colorado, 1911; Scholar in Psychology, Clark University, 1911–12; A.M., 1912.

ANNA BROWN COPELAND, A.M., Rochester, New York
Fellow in Psychology — 10 Chatham St.

Ph.B., University of Rochester, 1909; A.M., Radcliffe College, 1912.

KATHERINE ELLA DOLBEAR, A.M., Arlington
Fellow in Biology — 145 Woodland St.

Student, Tufts College, 1893–95; 1900–01; Massachusetts Institute of Technology, 1896–97; Student in Biology, Clark University, 1901–02; Scholar, 1911–12; A.M., 1912.

ERWIN OLIVER FINKENBINDER, A.M., Kent, Illinois — 900 Main St.
Fellow in Psychology and Research Assistant to Dr. Baird

Graduate, Northern Illinois State Normal School, 1908; A.B., University of Illinois, 1910; Fellow in Psychology and Research Assistant to Dr. Baird, Clark University, 1910–; A.M., 1911.

SARA CAROLYN FISHER, A.M., Chicago, Illinois
Fellow in Psychology — 15 Lagrange St.

A.B., Lombard College, 1909; A.M., University of Illinois, 1910; Fellow in Psychology, Clark University, 1910–.

GEORGE EARL FREELAND, A.B., Emporia, Kansas
Fellow in Psychology — 9 Woodbine St.

A.B., Kansas State Normal School, 1909.

ALBERT NICOLAY GILBERTSON, A.M., North Grafton
Fellow in Anthropology

A.B., University of Minnesota, 1908; A.M., 1909; Assistant in Sociology and Anthropology, University of Minnesota, 1908–09; Instructor in Psychology and Anthropology, University of Colorado, 1909–10; Instructor in Psychology, University of

Minnesota, 1910–12; Instructor in Psychology and Child-Study, Minneapolis Kindergarten Normal School, and Lecturer in Psychology and Pedagogy, Minneapolis Normal Art School, 1911–12.

ARTHUR EDWARD HAMILTON, Mexico City, Mexico
Fellow in Psychology — 101 May St.

Student in Psychology, Clark University, 1911–12.

ERNEST HAMMOND, A.M., Milan, Ohio
Fellow in Pedagogy — 5 Clifton St.

Pd.B., Ohio University, 1910; Scholar in Pedagogy, Clark University, 1910–11; A.M., 1911; Fellow, 1911–.

ARTHUR CLARK HARRINGTON, A.M., Berwick, Maine
Fellow in Psychology — 20 Winslow St.

A.B., Boston University, 1909; A.M., 1911.

MARION MYRL HARRISON, B.S., Philpot, Kentucky
Fellow in Chemistry — 8 Loudon St.

B.S., Kentucky State University, 1912.

JOSHUA ALLEN HUNTER, PH.D., Tyrone, Pennsylvania
Fellow in Pedagogy — 21 Florence St.

A.B., Pennsylvania State College, 1905; Instructor in Latin, State Normal School, Millersville, Pa., 1905–06; Graduate Student, Yale University, 1906–07; Instructor in Psychology and Pedagogy, State Normal School, Millersville, Pa., 1907–11; A.M., Pennsylvania State College, 1908; Ph.D., Kansas City University, 1909; Scholar in Pedagogy, Clark University, 1911–12; Fellow, September–December 15, 1912.

ARTHUR TABER JONES, B.S.
Fellow in Physics — 25 Ripley St.

B.S., University of Chicago, 1899; Graduate Scholar in Physics, University of Chicago, 1899–1900; Assistant in Physics, Purdue University, 1902–03; Instructor, 1903–06; Assistant Professor, 1906–11; Fellow in Physics, Clark University, 1911–.

SAKYO KANDA, A.M., Tokyo, Japan
Fellow in Psychology — 3 Ferdinand St.

Graduate, Kansei Gakuin, 1900; Scholar in Psychology, Clark University, 1907–08; Fellow, 1908–10; A.M., 1909; Scholar, 1911–12.

RANSOM A. MACKIE, A.M., Pullman, Washington
Fellow in Psychology — 2 Ripley Place

Student, Eugene University, Wash., 1906–08; University of Washington, 1908–09; Idaho State University, 1909–10; Scholar in Psychology, Clark University, 1911–12; A.M., 1912.

WILLIAM BRYANT PERRY, A.M.
Fellow in Psychology 13 Parker St.

B.D., Bishop Payne Divinity School, Va., 1898; A.B., Lotta University, N. C., 1908; Student in Psychology, Clark University, 1910–11; A.M., 1911; Scholar, 1911–12.

DONALD IRVING POPE, A.B., Red Cloud, Nebraska
Fellow in Psychology 13 Gates St.

A.B., University of Nebraska, 1898; Fellow in Sociology, University of Chicago, 1910–11.

WALLACE FRANK POWERS, A.M., Spencer
Fellow in Physics 67 Charlotte St.

A.B., Clark College, 1910; Assistant in Physics, 1910–; Scholar in Physics, Clark University, 1910–11; A.M., 1911; Fellow, 1911–.

ROY FRANKLIN RICHARDSON, A.B., Emporia, Kansas
Fellow in Psychology 101 May St.

A.B., Kansas State Normal College, 1909; Fellow in Psychology, Clark University, 1910–.

KIRKMAN KENSON ROBINSON, A.M., Wilderville, Oregon
Fellow in Psychology 101 Fairfield St.

A.B., University of Oregon, 1907; A.M., 1908; Scholar in Psychology, Clark University, 1910–11; Fellow, 1911–.

LILLIAN ROSANOFF, A.M., New York City
Fellow in Chemistry 7 Downing St.

A.B., Barnard College, 1908; A.M., Columbia University, 1911.

WILLIAM THOMAS SANGER, A.M., Empire, California
Fellow in Psychology 28 Hollywood St.

A.B., Bridgewater College, 1909; A.M., Indiana University, 1910; Professor of Philosophy and History, Bridgewater College, 1910–12.

JOHN FREDERIC WILLIAM SCHULZE, A.M., New York City
Fellow in Chemistry and Research Assistant to Dr. Rosanoff
23 Downing St.

B.S., New York University, 1911; W.H. Inman Fellow, New York University, 1911–12; Fellow in Chemistry and Research Assistant to Dr. Rosanoff, Clark University, 1911–; A.M., 1912.

WAYNE PRESCOTT SMITH, PH.D., Seattle, Washington
Fellow in Pedagogy — 14 Gardner St.

A.B., University of Wooster, 1891; A.M., 1892; Ph.D., 1893; Graduate Student, Harvard University, 1892–93; A.B., 1893; Graduate Student, University of Chicago, 1894–95, 1898–99; Honorary Fellow and Lecturer in Philosophy, 1894–95; Professor of Psychology and Education, California State Normal Schools, San José, 1895–96; Los Angeles, 1904–08.

ADELE ADAMS STEELE, A.M., Columbia, Missouri
Fellow in Pedagogy — 442 Park Ave.

A.B., Potter College, 1907; Principal, Normal Department, Western Union College, 1909–10; Scholar in Pedagogy, Clark University, 1910–11; A.M., 1911; Fellow in Pedagogy, 1911–.

ASA GEORGE STEELE, LL.D., Columbia, Missouri
Fellow in Psychology — 442 Park Ave.

B.S., University of Missouri, 1901; Professor of Physics and Chemistry, University of Chattanooga, 1904–05; Professor of Sciences, Ogden College, 1906–07; President, Clarksville College, 1907–08; LL.D., Bowdon College, 1908; Professor of Mathematics and Sciences, Western Union College, 1908–10; Fellow in Psychology, Clark University, 1910–; A.M., 1911.

HAROLD FREDERIC STIMSON, A.M., Rochdale — 8 Loudon St.
Fellow in Physics and Research Assistant to Dr. Webster

A.B., Clark College, 1910; Scholar in Physics, Clark University, 1910–11; A.M., 1911; Fellow in Physics and Research Assistant to Dr. Webster, 1911–.

MIRIAM VAN WATERS, A.M., Portland, Oregon
Fellow in Anthropology — 11 Richards St.

A.B., University of Oregon, 1908; Assistant, 1909–10; A.M., 1910; Fellow in Psychology, Clark University, 1910–12.

ELIZABETH LINDLEY WOODS, A.M., Portland, Oregon
Fellow in Psychology — 11 Richards St.

A.B., University of Oregon, 1905; Assistant Instructor in English Literature, 1905–06; A.M., 1910; Scholar in Psychology, Clark University, 1910–11; Fellow, 1911–.

SOSHICHI YAMADA, A.M., Shizuoka, Japan
Fellow in Pedagogy — 2 Oliver St.

Graduate, Aoyama College, Tokyo, Japan, 1906; A.B., De Pauw University, 1910; Fellow in Pedagogy, Clark University, 1910–; A.M., 1911.

ELIAS YANOVSKY, A.M., St. Petersburg, Russia
Fellow in Chemistry — 83 Birch St.

Graduate, University of St. Petersburg, 1911; Fellow in Chemistry, Clark University, 1911–; A.M., 1912.

SCHOLARS

SAMUEL FLAGG BEMIS, A.B.
Scholar in History — 30 Hamburg St.

A.B., Clark College, 1912; Assistant in History, 1912–.

LAWRENCE WHITNEY BRIGHAM, A.B.
Scholar in History — 55 May St.

A.B., Clark College, 1912.

WALTER GUY BUTLER, A.B.
Scholar in Economics — 29 Maywood St.

A.B., Clark College, 1912; Assistant in Economics, 1912–.

HARRY JOSEPH CAHILL, A.B.
Scholar in Psychology — 101 Gage St.

A.B., Holy Cross College, 1912.

FRED WINFRED CHAPLIN, A.B.
Scholar in Economics — 319 Lovell St.

A.B., Clark College, 1911.

SAMUEL CLAMAN, FITCHBURG
Scholar in Pedagogy — 48 Hollywood St.

Graduate, State Normal School, Fitchburg, Mass., 1902; Scholar, Clark University, 1910–11; Instructor in Pedagogy, Howard University, 1911–12.

CHARLES HENRY CUMMINGS, A.B., West Boylston
Scholar in Pedagogy

A.B., Clark College, 1912.

RAYMOND AUGUSTINE DUNPHY, A.B., North Brookfield
Scholar in Chemistry — 18 Hammond St.

A.B., Clark College, 1912.

JOHN JOSEPH FINNERAN, A.B.
Scholar in Psychology — 158 Shrewsbury St.

A.B., Holy Cross College, 1912.

JOHN JOSEPH HORAN, A.B.
Scholar in Psychology — 71 Granite St.
A.B., Holy Cross College, 1912.

BAITEN HORI, Tokyo, Japan
Scholar in Psychology — 91 Lovell St.
Graduate, Keiogijuku University, Tokyo, Japan, 1911.

HENRY JACOBSON, A.B., Leicester
Scholar in History
A.B., Clark College, 1912.

GEORGE ELLIS JONES, A.B., Centerville, Iowa
Scholar in Pedagogy — 145 Woodland St.
A.B., Kansas State Normal School, 1909.

JOSEPH KHOTIMLANSKY, St. Petersburg, Russia
Scholar in Chemistry — 24 Beaver St.
Graduate, St. Petersburg Gymnasium, 1907.

ABRAHAM MANDELSTAM, A.B., New York City
Scholar in Pedagogy — 20 Richards St.
A.B., College of the City of New York, 1903; Graduate Student, New York University, 1907–08; Fellow in Pedagogy, Clark University, 1911–12.

ARTHUR MONROE, A.M., Spencer
Scholar in History
A.B., Amherst College, 1897; Student, Harvard Law School, 1897–99; Student in History, Clark University, 1910–11; A.M., 1911; Scholar, 1911–.

HAROLD ARTHUR MORTON, A.B.
Scholar in Chemistry — 8 Pelham St.
A.B., Clark College, 1912.

JOHN JOSEPH ALOYSIUS NUGENT, A.B.
Scholar in Psychology — 52 Southgate St.
A.B., Holy Cross College, 1912.

FRANCIS JOHN O'BRIEN, A.B.
Scholar in Psychology — 69 East Central St.
A.B., Holy Cross College, 1912.

George Bernard O'Flynn, B.S.
Scholar in Pedagogy — 33 Hamilton St.
B.S., Massachusetts Agricultural College, 1912.

George Albert Prohaska, A.B.
Scholar in Psychology — 118 Belmont St.
A.B., Holy Cross College, 1912.

Allan Gale Rice, A.B.
Scholar in History — 862 Main St.
A.B., Clark College, 1910; Scholar in History, Clark University, 1910–.

Clarence Prouty Shedd, A.B.
Scholar in History — 4 Riedl Place
A.B., Clark College, 1909; Scholar in History, Clark University, 1911–.

John Francis Sullivan, A.B.
Scholar in Psychology — 28 Arlington St.
A.B., Holy Cross College, 1909.

Francis Aloysius Tobin, A.B.
Scholar in Pedagogy — 69 Gage St.
A.B., Holy Cross College, 1912.

Frances Washington Tufts, A.B.
Scholar in Biology — 562 Pleasant St.
A.B., Wellesley College, 1909; Student in Biology, Clark University, 1910–11; Scholar, 1911–.

Raymond Holder Wheeler, A.B., Berlin
Scholar in Psychology — 27 Downing St.
A.B., Clark College, 1912; Assistant in Psychology, 1912–.

Other Students

Earl Van Dusen Burdick, A.B., Hamilton, New York
Student in Psychology — 38 William St.
A.B., Colgate University, 1911; Instructor in French and German, Worcester Polytechnic Institute, 1911–; Student in Psychology, Clark University, 1911–.

HERBERT KIMBALL CUMMINGS, B.S., West Boylston
Student in Physics

B.S., Worcester Polytechnic Institute, 1910; Instructor in Physics and Chemistry, Alfred University, 1910–11; Instructor in Physics, Worcester Polytechnic Institute, 1911–; Student in Physics, Clark University, 1911–.

BERTHA CAROLINE DOWNING, M.D.
Student in Pedagogy 4 Downing St.

Harvard Annex, 1887; M.D., Woman's Medical College of Pennsylvania, 1896; Honorary Fellow in Psychology and Biology, Clark University, 1905–06; Honorary Fellow in Psychology, 1906–07; Student, 1909–10; A.M., 1910; Student in Anthropology, 1910–11; Student in Pedagogy, 1911–; Member American Association for the Study of the Feeble-Minded; Fellow of American Academy of Medicine.

ARTHUR OLIN GRIGGS, PH.B., Westford, Connecticut
Student in Pedagogy

Ph.B., Wesleyan University, 1898; Professor of Mathematics, Virginia Union University, 1903–05; Scholar in Pedagogy, Clark University, 1906–07; 1910–11; Fellow, 1911–12.

WILLIAM HENRY HAYES, A.B., Oxford
Student in Psychology

A.B., Wesleyan University, 1895; Student, Yale Divinity School, 1898–1901.

MESROB KEVORK JAMGOTCHIAN, A.M.
Student in Pedagogy 105 Summer St.

A.B., Euphrates College, Harpoot, Turkey, 1902; A.M., Yale University, 1912.

PEYSAH LEYZERAH
Student in Mathematics 71 Penn Ave.

Graduate, Dinaburg Real Gymnasium, 1911.

GEORGE WINFIELD MORRIS, A.B., Marlboro
Student in History

A.B., Brown University, 1898.

NELLIE MANN OPDALE, Marlboro
Student in Psychology

Student in Psychology, Clark University, 1907–.

CARL LISLE PERCY, B.D., Charlton
Student in Sociology

A.B., Middlebury College, 1907; Instructor in English, Atlanta Theological Seminary 1909–11; B.D., 1911; Student in Sociology, Clark University, 1911–.

CHARLES MOEN RICE, A.B.
Student in Mathematics 9 Bowdoin St.

A.B., Harvard University, 1882; Student in Mathematics, Clark University, 1909–.

ANCEL ST. JOHN, PH.B.
Student in Physics 53 Queen St.

Ph.B., University of Rochester, 1906; Instructor in Physics, Syrian Protestant College, Beirut, Syria, 1906–09; Assistant in Physics, Columbia University, 1909–10; Acting Professor of Physics, Emory and Henry College, 1910–12; Instructor in Physics, Worcester Polytechnic Institute, 1912–.

EDWARD BUTLER SAUNDERS, A.B., Fitchburg
Student in Psychology

B.D., St. Lawrence University, 1900; A.B., 1904; Student in Psychology, Clark University, 1906–.

ANNA ELDON SECHRIST
Student in Psychology 46 May St.

Graduate, State Normal School, Lock Haven, Pa., 1894.

IVY GIRVIN SMITH, Seattle, Washington
Student in Pedagogy 14 Gardner St.

Graduate, Hawaiian Territorial Normal School, 1898; California State Normal School, Los Angeles, 1906; Student in Education, University of California, 1904–05.

MARY ALICE WAITE, A.B.
Student in Sociology 105 Elm St.

A.B., Smith College, 1904; Student in Economics and Pedagogy, Clark University, 1910–12.

EDWARD CLINTON WILSON, A.B., Knoxville, Tennessee
Student in Psychology

A.B., Milligan College, 1887; Student in Psychology, Clark University, November 11–December 18, 1912.

Harry Carl Wilson
Student in Psychology 64 Coburn Ave.
Student, Baker University, 1903–05; Student, Boston University School of Theology, 1908–11.

Alexandra Yanovsky, St. Petersburg, Russia
Student in Psychology 83 Birch St.

Attendants upon Saturday Courses

Bertha I. Bird, Auburn
George H. Boyden, Worcester
William F. Butler, Worcester
Elizabeth S. Campbell, Worcester
Charles S. Carroll, Worcester
George A. Coe, Hopedale
Katherine A. Cook, Worcester
Oliver R. Cook, Worcester
Francis J. Dolan, Worcester
Edith A. Gainsman, Worcester
Ruth J. Johnson, Worcester
Mabel T. Kneeland, Worcester
Marie P. Lacouture, Millbury
Grace E. Oliver, Worcester
Lucy A. Osborne, Worcester
John F. Roche, Worcester
Kate E. Smith, Worcester
Ellen D. Tolman, Auburn

Undergraduates Attending One or More University Courses

Peng Chun Chang
Tetsutaro Nakanishi
Donald R. Taft
Earl W. Thomson

Florence Chandler 938 Main St.
Bursar, and Clerk of the University

Elizabeth Anna Felt 19 Bowdoin St.
Assistant in the Bursar's office

Mary Evelyn Fitzsimmons, S.B. 90 Florence St.
Private Secretary to the President

Instructors	25
Fellows, Scholars and Students	90
Saturday Courses	18
Undergraduates	4
Total	137

ADMINISTRATION

The trustees are the ultimate source of authority in all matters pertaining to the University. They act collectively, through committees, and also through the President of the University.

Duties of the President of the University

The duties of this office were defined by the Trustees, May 23, 1889, as follows:

The President of the University shall consult frequently with the Trustees on all matters that concern the welfare of the University, and attend the meetings of the Board. He shall confer with each instructor concerning the development of his department, determine the duties and authority of each, and preside at the meetings of the Faculty. He shall be the authorized medium of communication between the Board of Trustees and the officers of instruction, individually and collectively, in all matters involving the administration of the University. The enactments of the Board concerning instructors and their work, and all requests, complaints and proposals from the Faculty to the Trustees shall be made known through him. He shall exercise or provide such superintendence over buildings, apparatus, books and other property, as will secure their protection and appropriate use. Expenditures must not be ordered by any instructor of the University without his previous consent or the express authority of the Board.

These duties were more fully defined by By-Laws enacted by the Corporation, Sept. 26, 1889. These are as follows:

BY-LAWS

1. The President of the University shall preside on all public academic occasions, shall direct the official correspondence, study the wants and interests of the whole University and exercise a general superintendence over all its concerns. His first care, and that of the authorities of the University, shall be the departments already established, and next those closely related to them; but no other department shall be established until those already introduced have been brought to the highest state of efficiency then possible. All acts, however, which shall involve the expenditure of money in the administration of the University's affairs, shall be subject to the approval of the Board of Trustees or the Finance Committee for the time being.

2. As the efficiency of a University depends chiefly upon the quality of its Faculty, the Board of Trustees will hold the President to a strict but reasonable accountability for the fidelity and ability of each instructor. The President only shall have the power to select and appoint all officers of instruction, subject to the approval of the Board of Trustees. To make wise and well-considered appointments, to maintain harmony within the Faculty, and to increase their efficiency in research and instruction shall be his most important duty. If at any time the President shall be negligent in the discharge of these or other duties, or is from any cause disabled from discharging them, they may be exercised by the Board of Trustees.

3. The President of the University shall be the medium of communication between the Trustees and Instructors, individually and collectively, upon all matters within the field of

action of either body. He shall attend all meetings of the Board of Trustees, of which he shall be notified, and shall participate in their deliberations, but without the power to vote. All complaints and requests from members of one body to the other shall be made through him.

4. The President shall call and preside over all official meetings of the Instructors, and a record of their proceedings shall be kept. These records are in no case to be made known to others than the Trustees. They shall always be in the custody of the President, but may be inspected by the Trustees, or either of them, at any time.

5. The President of the University, in the absence of the Trustees or Finance Committee, shall have the entire direction and control of the persons employed about the University and not engaged in the work of instruction; the duties of all such persons shall be assigned and they shall be appointed or removed by him, subject to the approval of the Finance Committee.

6. No instructor shall order any books or apparatus, or anything connected with the work of instruction (beyond his appropriation), without the approval of the President. No expense for the care of buildings or grounds, nor for alterations or repairs within and upon the same shall be made without the approval of the Board of Trustees or the Finance Committee, such alterations or repairs in no case to exceed the appropriations made for that purpose. If the Trustees, or Finance Committee,or any person, shall make contracts in behalf of the University without authority, the officer or person making such contract shall become individually responsible therefor.

7. The officers of instruction shall be appointed for a term of from one to five years. At the end of this period the work of each instructor will be subjected to a careful scrutiny upon the results of which his reappointment shall depend, always provided, however, that any Instructor will be liable to be dis-

charged at any time for incapacity, neglect of duty or for such other cause as shall seem good to the Trustees.

8. Each Instructor shall give stated lectures to however few. He shall actively and zealously strive to maintain the highest possible standard, shall work in a spirit of hearty sympathy and coöperation, and shall encourage research by precept and, if possible, by example.

9. The foregoing By-Laws are intended to embody the provisions contained in a vote passed by the corporation on the twenty-third day of May, A.D. 1889, upon the motion of Judge Devens. (See above.) If at any time hereafter any discrepancy shall be found to exist between the two, said By-Laws shall be so far modified as to conform to the provisions of said vote.

10. No instructor shall engage in any outside professional or technical pursuit without the approval of the Board, the Finance Committee, or the President.

11. These By-Laws, or any one of them, may be changed, amended, or repealed by a vote of three-fourths at least of the Trustees at any meeting of their Board duly called, notified, and held for that purpose.

GENERAL STATEMENTS

The University now consists of nine departments, in which all its work and that of Instructors, Fellows and Scholars is grouped.

These departments are as follows:

I. Mathematics
II. Physics
III. Chemistry
IV. Biology
V. Anthropology
VI. Psychology
VII. Pedagogy
VIII. Economics and Sociology
IX. History

The Faculty

The Faculty elect Fellows and take action upon general requirements for the Doctor's and Master's degrees and other promotions, act and advise upon whatever may be officially submitted to them by the Board or by the President, and consider all matters not otherwise provided for and in which all departments of the University are alike interested.

Admission

Only graduate students or those of equivalent attainments are admitted to full membership in the University, except in rare and special cases.

At present no entrance examinations are required; but by testimonials, diplomas, personal interviews, or written specimens of work, the authorities must be satisfied that the applicants have scholarship enough to work to advantage, and zeal and ability enough to devote themselves to their chosen field. The methods of the University are too costly, and its energy and funds too precious, to be spent upon those who are not well trained, promising and in earnest.

It is highly desirable that candidates entering any of the nine departments shall have, beside a knowledge of the other subjects commonly taught in colleges, a reading knowledge of French and German.

For the select students who are received, it is the purpose of the University to open all its privileges and to supply every incentive possible in the way of books, facilities, and, above all, direct personal stimulus. The chief as well as the best work of this University is individual and involves daily suggestion, encouragement and direction. The limited number of students permits more or less personal instruction in each case.

Classes of Appointees

No clearly marked line exists between students and instructors. Fellows who have attained some degree of mastery in a special line of work sometimes give brief special courses, which may be attended by professors.

This is a stimulus to the student, and both tests and exhibits power in teaching.

I. DOCENTS

The highest residential appointment not involving membership in the Faculty is that of Docent. These positions are designed for men of marked gifts and attainments who have at least attained the doctorate and wish to engage in research, teaching, or both.

Class A. Free Docents

Each docent of this class will be expected to deliver a limited number of lectures on some topic within his department. In so doing, he shall be entirely independent of other instructors both in his choice of special topic and his manner of treating it, and responsible only to the President of the University, by whom he shall be appointed after consultation with the head of the department. The free docent shall have command of the resources of the department in the way of books, apparatus, etc., so far as this does not interfere with its regular work. By establishing free docents, the Faculty desires not only to maintain and guarantee the fullest academic freedom, but to expose itself to all the stimulus that can come by the rivalry of younger or outside men, and to introduce new topics and new departures in old ones.

Class B. University Docents

A University docent shall engage in research and may collaborate with the head of the department or other

member of the Faculty and supplement his work. He shall be appointed by the head of the department with the approval of the President.

Habilitation of Docents

A docent of either class may prepare and read in public an habilitation address representing original work after a term of service of a length and under conditions to be determined by the Faculty for each individual case. Upon doing this, he may be formally presented with a certificate or diploma granting him the *venia docendi* or licentiate, which shall not be a title or degree, but shall attest his fitness as scholar or investigator for an academic position and shall be regarded by the University as a brevet collegiate professorship. The fee for such a certificate shall be $25, which the Faculty shall have power to remit. The compensation of a docent of either class, if any, shall be determined by the President, and the fees to be paid him by students, if any, shall be determined by the Bursar.

It is believed that the difficulties of college authorities in selecting suitable professors may be somewhat diminished by the existence of such a select body of scholars of guaranteed scientific training, ability, and approved power to teach, and that this new grade may aid in raising the standard of academic scholarship.

II. QUIZ MASTERS

Each member of the University Faculty may, with the approval of the President, appoint one or more quiz masters who with the aid of his lecture notes, or

otherwise, shall conduct review classes upon his lectures and who may hold preliminary tests, but who shall not lecture or give instruction save as review. These positions shall be regarded as honorary and as a privilege of more advanced students in perfecting their own knowledge and acquiring practice in instruction.

III. NON-RESIDENT LECTURERS

The representatives of each department may, with the approval of the President, bring eminent experts for exchange or other lectures of a special nature at any time during the academic year. They may also in return, with the approval of the President, give similar brief courses in other institutions, provided this does not interfere with their full efficiency for the work of this University.

IV. HONORARY FELLOWS

Those who have already advanced to the Doctor's degree may be appointed Honorary Fellows and given the privileges of the University, including those of the Library. In past years many who have already taken this degree, either in this country or abroad, and who are awaiting academic appointment, have found these positions both helpful for their own further research and development and also advantageous for obtaining the collegiate and university appointments that they seek.

V. CANDIDATES FOR THE DEGREE OF DOCTOR OF PHILOSOPHY

Candidates for the Doctor's degree must have previously taken the Degree of Bachelor of Arts or have had

a substantial equivalent for the training implied by that degree.

At least one year, but in most cases three years, of graduate work are necessary for this degree. Examinations for it, however, may be taken at any time during the academic year when, in the judgment of the University authorities, the candidate is prepared, provided the requirement of one year's residence has been absolved.

For this degree one requirement is a dissertation upon an approved subject, to which it must be an original contribution of value. To this capital importance is attached. It must be reported on in writing by the chief instructor before the examination, printed at the expense of the candidate, and at least one hundred copies given to the University. However, in case of a dissertation of unusual length, or containing expensive plates, the Faculty shall have power, at the request of the candidate, to reduce this number of presentation copies to fifty.

Such formal or informal tests as the Faculty may determine shall mark the acceptance of each student or Fellow as a candidate for this degree. One object of this preliminary test shall be to insure a good reading knowledge of French and German. Such formal candidature shall precede the examination itself by a period prescribed in the special rules below.

The fee for the Doctor's degree is $25, payable before the examination. The presentation copies of the dissertation must be in the hands of the Librarian before the diploma is delivered. In exceptional cases, and by special action of the Faculty, the act of promotion may precede the presentation of the printed copies of the dissertation.

An oral, but no written, examination is required upon at least one minor subject in addition to the major before an examining jury composed of at least four members, including the head of the department and the President of the University, who is authorized to invite any person from within or without the University to be present and to ask questions. The jury shall report the results of the examination to the Faculty, who will recommend satisfactory candidates for the degree.

For the bestowal of this degree, the approbation of the Board of Trustees must in each case be obtained by their signature upon the diploma. They desire that the standard of requirements for it be kept the highest practicable, that it be reserved for those of superior ability and attainment only, and that its value be never suffered to depreciate.

It is to the needs of candidates for this degree that the lectures, seminaries, laboratories, collections of books, apparatus, etc., are especially shaped, and no pains will be spared to afford them every needed stimulus and opportunity. It is for them that the Fellowships and Scholarships are primarily intended, although any of these honors may be awarded to others.

On November 14th, 1900, the following vote was passed by the Board of Trustees:

That the University will admit candidates for the degree of Doctor of Philosophy and will confer that degree without regard to sex.

Special Rules concerning the Doctor's Degree

I. *Residence.* No candidate shall receive the degree of Doctor of Philosophy without at least one academic year's previous residence.

II. *Candidature for the Doctor's Degree.* Every applicant for the Doctor's degree shall fill out, before October fifteenth, the regular application blank provided at the office. This schedule shall be submitted to the head of the department. Before affixing his signature he shall satisfy himself, in such manner as he may desire, as to the fitness of the applicant.

III. When countersigned, this schedule shall be filed with the President, and the applicant will be examined in French and German by the annual committee for that purpose.

IV. In case of a favorable report by this committee, the applicant shall be a regular candidate for the degree.

V. Candidates complying with all preliminary conditions, including the examinations in French and German, before November first will be allowed to proceed to the doctor's examination at any time between May fifteenth following and the end of the academic year.

VI. *The Doctor's Dissertation.* The dissertation must be presented to the instructor under whose direction it is written, and reported upon by him before the doctor's examination. In every case the dissertation shall be laid before the jury of examination, at the time of examination, in form suitable for publication. This provision shall not, however, preclude the making of such minor changes later as the chief instructor may approve.

VII. The dissertation shall be printed at the expense of the candidate and the required copies deposited with the Librarian within one calendar year after the first of October following the examination. The candidate alone will be held responsible for the fulfilment of these conditions.

VIII. The favorable report of the chief instructor, filed in writing with the Clerk of the University, shall be a sufficient imprimatur or authorization for printing as a dissertation. The printed copies shall bear upon the cover and title page the statement of approval in the following words, over the signature of the chief instructor:

> A Dissertation submitted to the Faculty of Clark University, Worcester, Mass., in partial fulfilment of the requirements for the degree of Doctor of Philosophy, and accepted on the recommendation of
>
> (NAME OF CHIEF INSTRUCTOR)

IX. *Examinations for the Doctor's Degree.* The examinations for the doctor's degree may be held at any time during the academic year, provided that at least one academic year has elapsed since the completion of the preliminaries of candidature, except in the case of fulfilment of these conditions between the beginning of any academic year and November first of that year, to which case Rule V applies. The examinations shall be held at such hours and places as the President may appoint.

X. Examinations may also be held during the regular vacations of the University, but for these an additional fee of five dollars to each examiner and the reasonable travelling expenses of any examiners who are out of town, all payable in advance, will be required.

VI. CANDIDATES FOR THE DEGREE OF MASTER OF ARTS

This degree is conferred upon candidates who comply with the following requirements:

1. The candidate shall have previously taken the degree of Bachelor of Arts, or have had a substantial

equivalent for the training implied by that degree, to be determined by special vote of the Faculty; but such degree or training must involve a good preparation for the work proposed for the Master's degree, in order that it may be accepted.

2. The candidate must devote a full academic year to post-graduate work in this University after receiving the Bachelor's degree or the training accepted as its equivalent. This work shall be mainly in one department, but the candidate may do also such other work as shall be advised by the head of his principal department, —whose approval of the whole course shall be necessary. In particular cases, the candidate may be allowed, by special vote of the Faculty, to divide his work between two years; but the aggregate must, in all cases, amount to a full year's work, at least.

3. The candidate must satisfy the representatives of his principal department that he has done his work faithfully and has mastered the subjects involved, by such written and oral examinations and other tests as the department may require. The head of the department shall make a written report to the Faculty of the grounds on which the candidate is recommended, specifying the amount and character of his work, and this report shall be filed in the office.

4. The candidate must present a thesis or written report on some topic included in his course or closely related to it, that shall receive the approval of the representatives of his principal department, be accepted by the Faculty, and filed in the office.

5. Every candidate recommended for the Master's degree shall pay a fee of ten dollars.

6. The Master's degree will be conferred at the annual commencement in June of any year on those candidates only who shall have made written application to be considered as such on or before January 15th preceding and shall have fulfilled all the conditions here specified at least one week before Commencement, at which time the academic year shall be regarded as ending for the purposes of section 2.

VII. SPECIAL STUDENTS NOT CANDIDATES FOR A DEGREE

Any one desiring to undertake a special and approved line of research, and whose attainments are such as to satisfy the requirements of the University, may also be received. This class includes persons who may desire to devote themselves exclusively to one or more of the special branches—mathematics, physics, chemistry, biology, anthropology, psychology, pedagogy, economics and sociology, or history,—but who do not care to matriculate or become candidates for a degree.

These students, provided they satisfy the heads of the departments of their training and competency in one subject, in which they must be advanced (although they may be less so, or even beginners, in other subjects), may be allowed entire freedom in their choice and combination of studies, and as special students may enjoy all the privileges of the University.

These students may, with the approval of the President, be received for less than an entire year.

VIII. PRELIMINARY CANDIDATES

Non-university students of less special or less advanced standing than the above classes, who contemplate becoming candidates for some higher degree, may also be received.

Students of this class must satisfy the authorities of the University of their attainments and that they contemplate advancing to a degree higher than that of A.B. The privileges and status of these students will be more fully defined later. They may, in exceptional cases, be elected to Scholarships.

Fellowships and Scholarships

From the George F. Hoar Fund of $100,000 provided by the generosity of Andrew Carnegie, the sum of $3,000 is now available for Junior and Senior Fellowships in the University. While the sums attached to these appointments are not fixed, a Senior Fellow may receive $200 together with the remission of fees; which makes the value of the appointment $300. A Junior Fellow may receive $100 with remission of fees, which makes the value of the appointment $200. Besides these, other appointments of Senior and Junior University Scholarships, with remission of fees, are made.

A CITIZEN'S FUND

A citizen of Worcester has given a fund of $5,000, the income of which is to be used for the aid of "some one or more worthy native born citizens of the city of Worcester who may desire to avail themselves of the advantages of the institution."

THE FIELD FUND

Mrs. Eliza W. Field has also given $500 to be called the "John White Field Fund," the income of which is "to provide for the minor needs of a Scholar or Fellow."

The following regulations apply to the award of the income of the Field Fund:

1. Regard is had to the intellectual ability of the candidate as well as to need of pecuniary assistance.

2. Only candidates who have spent three months at the University are considered.

3. The head of each department will consider and report to the Faculty desirable cases in his department.

4. Applications are received not later than December 15th, and the awards made as soon as possible after the Christmas recess.

THE ELIZA D. DODGE FUND

Mrs. Dodge has given $1,000 to be known as the "Eliza D. Dodge Fund," the income only to be expended in aid of graduate students of limited means engaged in research work.

PURPOSE AND CONDITIONS OF FELLOWSHIPS AND SCHOLARSHIPS

Fellowships at Clark University are intended for young men and women of promise who desire to pursue post-graduate studies in order to fit themselves for intellectual careers. It is desirable, but not required, that candidates for these positions should intend to proceed to the degree of Doctor of Philosophy or to equivalent attainments. In general, those intending to devote themselves to some

special branch of learning are preferred to those directly fitting themselves for one of the three learned professions, although the latter are not excluded.

No application blanks are provided, but it is desired that the candidate should state fully and in writing his previous course of study and submit testimonials or diplomas, especially such as indicate a decided preference for some particular department. These should be accompanied also, if practicable, by some specimen of the candidate's work. Applications will be considered in May and in October and should be in the hands of the President on or before the first day of either month. In special cases vacancies may be filled by appointments at any time during the year. The names of unsuccessful candidates will not be made public.

Fellows must reside in Worcester during the entire academic year, devote themselves to special studies under the direction of their instructors, and give such evidence of progress or proficiency before the end of the year as the authorities shall require. It is generally expected that they will undertake some work of research during the year. They must coöperate in promoting harmony, order, and all the ends of the University, must not teach elsewhere, and may be reappointed at the end of the year. Being intended primarily as honors, both Fellowships and Scholarships are awarded without reference to pecuniary needs, so that those Fellows able and desiring to do so may relinquish the emolument and retain the title.

The paying fellowships will, for the present, be restricted to the departments of mathematics, physics, chemistry, biology, psychology, pedagogy, anthropology, and history.

Besides field work, excursions to institutions (public and private), coaching and cram classes, clubs, examinations, and other modes by which knowledge now seems best imparted and retained, the following educational methods are prominent:

Lectures. The Trustees desire that each instructor, of however few students, should prepare and deliver regular lecture courses, with diagrams, illustrative apparatus, and reference to standard text-books and the best current literature upon each topic. Advanced students are also encouraged to supplement the work of the professors by giving occasional special lectures and courses. Public lectures will be given from time to time.

Seminaries and Conferences. These are stated meetings for joint systematic work, under the personal direction of the professor, in some special part of his subject. Here students preparing theses and papers for publication in the journals edited at the University read them in incomplete form for mutual criticism and help. Here, also, the results of individual reading are reported for the benefit of all; views are freely criticised; new inquiries, methods, comparisons, standpoints, etc., suggested. From the mutual stimulus thus given many important works have proceeded and the efficiency of universities has been greatly increased.

Laboratory Work. For beginners this has been from the first the best of all forms of apprenticeship, bringing student and professor to a closer and mutually stimulating relation. Here the manipulation of apparatus is learned, processes are criticised, results obtained

by other investigators are tested, and methods discussed and perfected, with a view to developing that independence in research which is the consummation of scientific culture.

Notices

The charge for tuition, giving all the privileges of the University, but not covering the laboratory fees, is $100 per annum.

Board and lodging can be obtained near the University at very moderate rates.

Intending students will be given information, so far as possible, upon any of these or other points, in advance of official announcement, upon addressing the Clerk of the University, Miss Florence Chandler, Worcester, Mass.

All members of the University are expected to be present at the opening of each term and to continue in attendance to its close.

The following are the statements and announcements of the departments for the academic year, 1913–1914.

I. MATHEMATICS

Programme for 1913–1914

Instruction in Mathematics

The chief aim of the department is to make independent investigators of such students as have mathematical taste and ability; these naturally look forward to careers as teachers of the higher mathematics in colleges and universities, and we believe that the course of training best adapted to the development of investigators is also that which is most suitable for all who would be efficient college professors, even if they are not ambitious to engage in research. The first essential of success in either of these lines is the habit of mathematical thought, and the direct object of our instruction is the acquisition of this habit by each of our students. With this end in view, we expect every student to make himself familiar with the general methods and most salient results of a large number of different branches of mathematics, conversant with the detailed results and the literature of a few branches, and thorough master of at least one special topic to the extent of making a real contribution to our knowledge of that subject.

In accordance with these principles, the instruction is given by means of introductory, advanced and special courses of lectures, seminaries, and personal guidance in reading and investigation.

The introductory courses (mostly given in alternate years) treat the following subjects:

Analytic Geometry of Conics, Higher Plane Curves, Quadrics, Higher Surfaces, and Twisted Curves; 5 hours a week, through the year.

DIFFERENTIAL EQUATIONS, AND CALCULUS OF VARIATIONS; 5 hours a week, through the year.

THEORY OF FUNCTIONS OF REAL AND IMAGINARY VARIABLES, ELLIPTIC FUNCTIONS, AND DEFINITE INTEGRALS; 5 hours a week, through the year.

THEORY OF NUMBERS; 2 hours a week, one half-year.

MODERN SYNTHETIC GEOMETRY; 2 hours a week, one half-year.

ALGEBRAIC SUBSTITUTIONS AND THEIR APPLICATION TO THE THEORY OF EQUATIONS; 2 hours a week, one half-year.

ALGEBRAIC INVARIANTS; 2 hours a week, one half-year.

FINITE DIFFERENCES; 2 hours a week, one half-year.

It is expected that every student will take each course in the earliest year of his residence in which it is given, unless he has already completed an equivalent course elsewhere. The chief object of these courses is to make the student familiar with the various methods of mathematical research and the concepts of mathematical thought at the present day. Thus, for example, curves and surfaces are treated by modern methods from the beginning, with adequate consideration of the discoveries of the great geometers of recent times. The usual college courses in the theory of algebraic equations, analytic geometry, and the differential and integral calculus furnish all the necessary preparation for these introductory courses, although it is very desirable that the student be acquainted with the properties of determinants and their application to the solution of linear equations, and with the methods of solving differential equations of the simpler types. Deficiencies in these subjects may be made up by attendance on the corresponding courses in the Collegiate Department of the University.

Special advanced courses, open to all who are prepared for them, are given annually in subjects varying with the interests of the instructors and the needs of the students. These advanced courses are not repeated at regular intervals, but properly prepared students will receive the personal assistance of one or other of the instructors in reading any

subject not announced for the year in which they desire to take it.

The number and scope of the advanced courses given each year have been, thus far, regulated by the number of students qualified to profit by them and by the individual interests of the instructors; these courses will be increased, both in number and variety, whenever a real demand for such an increase shall make itself apparent. While the present purely scientific character of the University precludes instruction in strictly technical branches, we hope that the time is not far distant when the demand shall make it advisable, and increased facilities shall make it possible, to announce courses in Descriptive Geometry, Graphical Statics, Mathematical Astronomy, Vital Probabilities, and all the more important applications of mathematics to other sciences and to technical subjects. The applications of mathematics to physics already receive adequate consideration, and the further extension of such applications awaits only a demand for it on the part of students.

The subjects in which advanced courses may be expected to be given every few years include the following:

History of Mathematics.

Arithmetic: Numerical computations; Theory of numbers; Finite differences and the Calculus of operations; Probabilities and the Theory of errors.

Algebra: Substitution-groups and the Galois theory of equations; Invariants; Quadratic forms; Simultaneous equations (including Restricted systems); Multiple algebra.

Higher Analysis: Differential equations, ordinary and partial; Continuous groups; Definite integrals and Fourier's series.

Theory of Functions: Functions of real and complex variables; Point-aggregates; Elliptic functions; Abelian integrals.

Geometry: Modern synthetic geometry; Analytic geometry of higher plane curves, higher surfaces, and twisted curves; Rational and uniform transformations of curves and surfaces; Infinitesimal geometry; Analysis situs; Quaternions; Hyperspace and non-euclidean geometry.

Symbolic Logic.

Other courses will be given whenever there is a demand for them, as in the past. The instructors are always glad to assist students in any line of mathematics that falls within the range of their own studies. The small number of students makes it possible to give personal attention to individuals, and the intimate and confidential relation thus established between pupil and teacher is an advantage that cannot be overestimated and ought not to be left out of account by the prospective student in determining where his studies shall be pursued.

For the academic year 1913–14, the following courses of lectures are announced:

BY PROFESSOR STORY

Introductory Course:

HIGHER ALGEBRA; 3 hours a week through the year.

Advanced Courses:

HYPERSPACE AND NONEUCLIDEAN GEOMETRY; 3 hours a week, through the year.

ALGEBRAIC INVARIANTS; 3 hours a week, first half-year.

INFINITESIMAL GEOMETRY; 3 hours a week, second half-year.

SEMINARY FOR ADVANCED STUDENTS; through the year.

BY PROFESSOR TABER

Introductory Course:

DIFFERENTIAL EQUATIONS AND CALCULUS OF VARIATIONS; 5 hours a week, through the year.

Advanced Courses:

STRUCTURE OF FINITE CONTINUOUS GROUPS; 2 hours a week, first half-year.

INTEGRAL EQUATIONS; 2 hours a week, second half-year.

SEMINARY; through the year.

BY PROFESSOR WEBSTER

[See announcement of Department of Physics, courses 10, 11, 13, 14.]

BY M. DE PEROTT

Introductory Course:

THEORY OF NUMBERS; 2 hours a week, first half-year.

Advanced Course:

ALGEBRAIC SUBSTITUTIONS AND THEIR APPLICATION TO THE THEORY OF EQUATIONS; 2 hours a week, second half-year.

BY DR. WILLIAMS

Introductory Course:

DETERMINANTS AND THE THEORY OF EQUATIONS; 2 hours a week, through the year.

While desirous of supplying all possible facilities to those who wish to pursue studies in special branches, and to those who, already occupying permanent positions, have but a limited leave of absence, we have made it our chief object to provide a thorough training for those who, having just completed a college course, have not yet entered upon their life-work. This provision consists of such courses of lectures, seminaries, and individual assistance as should enable a faithful student endowed with the proper natural ability to satisfy the requirements for the degree of Doctor of Philosophy at the end of his third year with us. The requirements for this degree have been determined by our conception of the ideal teacher, as already stated. To acquire the necessary breadth of knowledge of mathematics as a whole, the candidate is expected to attend, during his first two years, specified introductory courses of lectures on the general principles, methods, and results of all the more important branches of pure mathematics, to supplement these lectures by private reading and to take an active part in the seminary. In the seminary, a special topic more or less directly connected with the subject of some lecture, is assigned, from time to time, to each student, who is required to read it up and make an oral report

upon it before the class. Each candidate for the Doctor's degree is expected to attend a number of advanced courses. He spends the greater part of his third year in the original investigation, under the constant personal guidance of one of the instructors, of a topic of his own selection. In preparing for this investigation he is required to make a practically complete bibliography of the subject and to read all the more important available articles that have been written on it. The results of the investigation, embodied in a dissertation suitable for printing, must be submitted to the instructor under whose direction the work was done, and must receive his approval before the candidate will be admitted to the final examination for the degree. This approval will not be given unless the dissertation is satisfactory in form and completeness and the results are sufficiently novel and important to constitute a real contribution to science. The dissertation is, in fact, the main criterion by which the candidate is judged, and no amount of other work will compensate for its defects.

Each of the instructors is engaged in research and has always a number of investigations planned for himself, which have often been carried to a well advanced stage but are not completed for want of time. Such incomplete investigations are given to properly prepared candidates for the Doctor's degree, and they receive from the instructor all the assistance necessary for the completion of the work, thus becoming, to a certain extent, collaborateurs with the instructor.

The preparation of a bibliography of any topic is greatly facilitated by a classified index of mathematical literature on the card-catalogue plan, which has been prepared under the supervision of Professor Story and now includes nearly one hundred thousand titles of periodical articles, separate memoirs, and books in all fields of pure mathematics. This

index is much more complete than the Royal Society's catalogue, even in the restricted field of that catalogue (periodicals published between 1800 and 1900), and will be extended as rapidly as possible.

The ability of our graduates to carry on research and the excellence of the work actually done is assured by the regulation that each dissertation accepted by us as worthy of the degree shall be printed with the explicit approval of a member of our Faculty. It is evident that, whereas any one that has the necessary preparation and taste for mathematics may profit by the advantages here afforded, only those who have a certain amount of mathematical genius can secure the degree.

In making appointments to fellowships and scholarships we have endeavored to maintain the same high standard. We are on the lookout for mathematical geniuses; but it is difficult to determine from the evidence of others whether candidates come up to our standard or not; so that we have adopted the general policy of giving the best appointments to those only that have been with us for at least one year, and about whom we are in position to judge for ourselves. Of course, this policy could not be carried out during the earlier years of the University, and its effect is apparent in the fact that, whereas seventy-five per cent of the students that entered the mathematical department during the first three years remained with us but one year, only thirty-three per cent. of those that have been admitted from 1892 to the present time left at the end of their first year. We do not mean to imply that those who left before completing our course were inferior in ability to those who remained three years, but we desire particularly to encourage men who can and will go forward to the degree.

Nearly all of those who have studied mathematics with us have adopted teaching as a profession, sixty-eight per

cent are now members of college faculties, and thirteen per cent are engaged in higher school work. Those who have received the doctor's degree have generally secured at once desirable positions in which to begin their life-work, and most of them have already acquired for themselves, by distinguished ability, very decided influence in the institutions with which they are connected.

The degree of Master of Arts will be conferred upon students who complete with credit an approved course of one year and present a satisfactory thesis.

Every facility for the study of special branches will be given to properly prepared students who are not candidates for a degree, as also to those who, having already attained to the Doctor's degree (here or elsewhere), wish to continue mathematical study or investigation.

Material Facilities

The library is provided with the more important text-books, treatises, and memoirs on the various branches of mathematics, as well as the principal journals and transactions of learned societies that are devoted to any considerable extent to mathematics. A list of these journals will be found below.

The mathematical department possesses a good collection of models, a Thomas arithmometer, and an Amsler planimeter with revolving table.

List of Journals Relating to the Exact Sciences in the University Library

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Amsterdam.

Koninklijke akademie van wetenschappen. Verhandelingen, 1854 to date. Complete.

Revue semestrielle des publications mathématiques. 1893 to date. Complete.

BALTIMORE.

American chemical journal. 1879 to date. Complete.

American journal of mathematics. 1878 to date. Complete.

BANGKOK.

Siam society. Journal. 1905-07.

BERLIN.

Berliner mathematische Gesellschaft. Sitzungsberichte. 1902 to date. Complete.

Chemisches Centralblatt. 1897 to date. Complete.

Deutsche chemische Gesellschaft. Berichte. 1868 to date. Complete.

Fortschritte der Physik. 1847 to date. Complete.

Jahrbuch über die Fortschritte der Mathematik. 1868 to date. Complete.

Journal für die reine und angewandte Mathematik. 1826 to date. Complete.

Königlich-preussische Akademie der Wissenschaften. Mathematische und naturwissenschaftliche Mittheilungen aus den Sitzungsberichten. 1882-97. Complete.

Zeitschrift für angewandte Chemie. 1888 to date. Complete.

BOLOGNA.

Istituto di. Bologna. Reale academia delle scienze.

Commentarii. 1731-1791. Complete.

Novi commentarii. 1834-1849.

Memorie fis. e mat. 1806-1910.

Memorie. 1850 to date. Complete.

Scientia; rivista di scienza. 1910 to date. Complete.

BOSTON.

American academy of arts and sciences. Proceedings. 1870 to date. Complete.

North American Review. 1815–1886.

Technology review. 1899 to date. Complete.

BOULDER, COLORADO.

University of Colorado. Studies. 1902 to date. Complete.

BRAUNSCHWEIG.

Deutsche physikalische Gesellschaft. Berichte. 1903 to date. Complete.

Jahresbericht über die Fortschritte der Chemie. 1847 to date. Complete.

BRESLAU.

Kaiserlich-Leopoldinisch-carolinische deutsche Akademie der Naturforscher. 1843.

BRUXELLES.

Académie royale des sciences des lettres et des beaux-arts de Belgique.

Bulletins. Ser. 3. 1889 to date.

Mémoires couronnés et mémories des savants étrangers. 1889-90.

CAMBRIDGE, ENGLAND.

Cambridge philosophical society.

Proceedings. 1843 to date. Complete.

Transactions. 1822 to date. Complete.

CAMBRIDGE, MASSACHUSETTS.

Science. 1883 to date. Complete.

CHARLOTTESVILLE, VIRGINIA.

Annals of mathematics. 1884 to date. Complete.

CHICAGO.

Astrophysical journal. 1895 to date. Complete.

Terrestrial magnetism. 1896 to date. Complete.

COLUMBIA, MISSOURI.

University of Missouri studies. Science series. vol. 1. 1905-07.

DRESDEN.

Zeitschrift für Chemie und Industrie der Kolloide. 1906 to date. Complete

EASTON, PENNSYLVANIA.

American chemical society.

Chemical abstracts. 1907 to date. Complete.

Journal. 1879 to date. Complete.

Proceedings. 1878 to date. Complete.

EDINBURGH.

Edinburgh mathematical society. Proceedings. 1884-1907.

Edinburgh philosophical journal. 1819-1826.

Edinburgh royal society transactions. 1873 to date. Complete.

GÖTTINGEN.

Königliche Gesellschaft der Wissenschaften. Nachrichten von der k. Gesellschaft der Wissenschaften und der Georg-Augusts-universität. 1853 to date.

GREIFSWALD.

Archiv der Mathematik und Physik. 1901 to date.

HAARLEM.

Hollandsche maatschappij der wetenschappen. Archives néerlandaises des science exactes et naturelles. 1866 to date. Complete.

HALIFAX.

Nova Scotian institute of science.

Proceedings and transactions. Halifax. 1890 to date. Complete.

HALLE.

Zeitschrift für Electrochemie. 1895 to date. Complete.

HAMBURG.

Mathematische Gesellschaft. Mittheilungen. 1890 to date. Complete.

Zeitschrift für anorganische Chemie. 1892 to date. Complete.

HEIDELBERG.

Annalen der Chemie. 1832 to date. Complete.

INDIANAPOLIS.

Indiana academy of science. Proceedings. 1895-98.

ITHACA.

Journal of physical chemistry. 1896 to date. Complete.

LAWRENCE, KANSAS.

Kansas University science bulletin. 1902-1908.

LEIPZIG.

Acta Eruditorum, 1682-1731. 50 vols. Supplementa, 1692-1734. 10 vols. Indices generales, 1693-1733. 10 vols. in 5.

Nova Acta Eruditorum, 1732-1782. 13 vols. Supplementa, 1735-1739. 3 vols. in 2.

Annalen der Physik. 1824 to date. Beiblätter, 1889 to date. Complete.

Archiv für Optik. vol. 1. 1908.

Chemische Novitäten. 1905-08.

Deutsche Mathematiker-vereinigung. Jahresbericht. 1890 to date. Complete.

Encyklopädie der mathematischen Wissenschaften mit Einschluss ihrer Anwendungen.

Fortschritte der Chemie, Physik und physikalischen Chemie. 1909.

Internationale Mathematiker-congresse. Verhandlungen. 1897 to date. Complete.

Jahrbuch der drahtlosen Telegraphie und Telephonie. 1908 to date. Complete.

Jahresbericht über die Leistungen der chemischen Technologie. 1856 to date. Complete.

LEIPZIG (Continued).

Journal für praktische Chemie. 1834 to date. Complete.

Königlich-sächsische Gesellschaft der Wissenschaften.

Berichte über die Verhandlungen der mathematisch-physischen Classe. 1849 to date. Complete.

Abhandlungen der mathematisch-physischen Classe. 1852 to date. Complete.

Mathematische Annalen. 1869 to date. Complete.

Zeitschrift für Chemie. 1866-71.

Zeitschrift für Mathematik und Physik. 1856 to date. Complete.

Zeitschrift für physikalische Chemie. 1887 to date. Complete.

Zeitschrift für mathematische und naturwissenschaftliche Unterricht. 1903 to date.

LIÈGE.

Société royale des sciences. Mémoires. 1843 to date. Complete.

LONDON.

British academy. Proceedings. 1905. 1907.

British association for the advancement of science. Reports. 1831 to date. Complete.

Chemical news and journal of physical science. 1904 to date. Complete.

Chemical society of London.

Annual reports on the progress of chemistry. 1905 to date. Complete.

Journal. 1849 to date. Complete.

Electrician. 1891 to date. Complete.

International catalogue of scientific literature. 1902 to date. Complete.

London mathematical society. Proceedings. 1865 to date. Complete.

Royal Society.

Proceedings. 1800 to date Complete.

Philosophical transactions. 1665 to date. Complete.

Nature. 1870 to date. Complete.

Nineteenth century. 1877 to date. Complete.

Philosophical magazine. 1798 to date. Complete.

Quarterly journal of pure and applied mathematics. 1857 to date. Complete.

Quarterly review. 1809-1885.

Science abstracts. 1898 to date. Complete.

Science progress in the 20th century. 1907 to date. Complete.

MADISON.

Wisconsin academy of arts and sciences. Transactions. 1898.

MANILA.

Philippine journal of science. 1906 to date. Complete.

MILANO.

Annali di matematica, pura ed applicata. 1889 to date.

Reale istituto lombardo di scienze e lettere. Classe di scienze mathematieech naturali.

Rendiconti. 1864-67. Complete.

Rendiconti. 1868 to date. Complete.

Memorie. 1843 to date. Complete.

MONTREAL.

Royal society of Canada. Proceedings and transactions. 1882-1906.

NEW HAVEN.

American journal of science and arts. 1871 to date. Complete.

NEW YORK.

American mathematical society.

Annual register. 1892 to date. Complete.

Bulletin. 1894 to date. Complete.

Transactions. 1900 to date. Complete.

American society of biological chemists. Proceedings. 1907 to date. Complete.

Appleton's journal of literature, science and art. 1869-76.

Electrical world and engineer. 1907 to date. Complete.

Journal of biological chemistry. 1905 to date. Complete.

The Minerva. 1824-26.

New York Mathematical Society. Bulletin. 1891-94. Complete.

Popular science monthly. 1872 to date. Complete.

Physical review. 1894 to date. Complete.

OXFORD.

Messenger of mathematics. 1862 to date. Complete.

PALERMO.

Circolo matematico di Palermo. Rendiconti. 1887 to date. Complete.

PARIS.

Annales de Chemie et de physique. 1789-1908.

Annales scientifiques de l'École normale supérieure. 1864 to date. Complete.

Association française pour l'advancement des Sciences. Comptes rendus des sessions. 1873 to date. Complete.

Bulletin des sciences mathématiques. 1870 to date. Complete.

Bureau international des poids et mesures 1881. to date. Complete.

École polytechnique. Journal. 1794 to date. Complete.

Institut de France. Académie des sciences. Comptes rendus hebdomadaires des séances. 1835 to date. Complete.

Journal de mathématiques pures et appliquées. 1836 to date. Complete.

L'éclairage électrique. 1894-1907.

Nouvelles annales de mathématiques. 1842 to date. Complete.

Revue des deux mondes. 1908 to date. Complete.

Revue générale des sciences pures et appliquées. 1903 to date. Complete.

Revue scientifique. 1863 to date. Complete.

Société chimique de Paris. Bulletin. 1858 to date. Complete

Société mathématique de France. Bulletin. 1873 to date. Complete.

ST. PETERSBURG.

Journal of physical chemistry. (Russian Text.) Chemical section and physical section. 1909 to date.

PHILADELPHIA.

Academy of natural sciences of Philadelphia. Proceedings. 1890 to date. Complete.

American electrochemical society. Transactions. 1902-1910. Complete.

Lippincott's magazine of literature, science and education. 1868-1881.

PISA.

Il Nuovo Cimento. 1891 to date. Complete.

ROME.

Reale accademia dei lincei. Atti. Rendiconti. etc. 1847 to date.

SACRAMENTO.

Lick observatory. Publications. 1887-1903.

SALEM, MASSACHUSETTS.

American Association for the advancement of science. Proceedings. 1848 to date. Complete.

SIDNEY.

Australasian association for the advancement of science. 1888 to date. Complete.

STOCKHOLM.

Acta mathematica. 1882 to date. Complete.

Bibliotheca mathematica. 1884 to date. Complete.

STRASSBURG.

Zeitschrift für physiologische Chemie. 1877 to date. Complete.

STUTTGART.

Jarhbuch der organischen Chemie. 1908. to date. Complete.

Sammlung Chemischer und chemisch-technischer Vorträge. 1896 to date. Complete.

TOKYO.

Journal of the College of Science of the Imperial University of Japan.

Mathematico-physical society. Proceedings (Tôkyô sûgakubuturigakkwai kizi). 2nd Ser. 1901 to date. Complete.

TOULOUSE.

Université de Toulouse. Faculté des sciences. Annales. 1887 to date. Complete.

URBANA, ILLINOIS.

University of Illinois. University studies. 1900-1908.

WASHINGTON, D. C.

National academy of sciences.

Biographical memoirs. 1877 to date. Complete.

Memoirs. 1883-1902.

Reports. 1883 to date. Complete.

U. S. Bureau of Standards. Bulletin. 1905 to date. Complete.

U. S. Naval observatory. Publications 1900-1903.

U. S. Naval observatory. Astronomical and meteorological observations. 1885-89.

WIESBADEN.

Zeitschrift für analytische Chemie. 1862 to date. Complete.

WIEN.

Kaiserliche Akademie der Wissenschaften.

Denkschirften; mathematisch-naturwissenschaftliche Classe. 1850-1908.

Sitzungsberichte der mathematisch-naturwissenschaftlichen Classe. 1848 to date. Complete.

Monatshefte für Mathematik u. Physik. 1908.

Monatshefte für Chemie und verwandte Theile anderer Wissenschaften. 1881 to date. Complete.

WORCESTER.

The Mathematical review 1896–97.

II. PHYSICS

The Department of Physics of Clark University is exclusively a department for graduate study and research in pure and applied physics. In order to set forth to the intending student the facilities of this department, stress may be laid on a number of points in which it is believed that the conditions here are exceptional.

First, the fact that the attention of the professor is not distracted from the needs of the student by other duties, which, combined with the small number of students in the department enables an amount of personal attention to be given to each one which is perhaps unique in this country. The head of the department is able to see each student and to give him personal advice in the conduct of his researches or his studies every day if necessary. The facilities without which no graduate department of research in physics can be complete are comprised under three heads: first, a systematic course of lectures in theoretical or mathematical physics; second, a laboratory with a sufficient number of rooms for individual work and with a sufficient equipment of apparatus and an instrument shop for the speedy production of whatever may be necessary for the research in hand; third, a library containing the classic works on physics, with full sets of journals and proceedings of learned societies by which the history of progress, past and present, may be studied, and kept up-to-date by the continual purchase of the latest works. In all these directions the facilities offered by this department invite attention.

The lecture courses are so arranged as to cover in a cycle

of two years all the principal subjects and methods of theoretical physics. The pursuit of them will fit the student to read and study with facility any memoirs on mathematical physics. The courses are so arranged that, although they follow in order, it is possible for a student to begin in either year of the cycle. The regular courses are those not marked with a star, and constitute a course of from five to seven hours weekly. The starred courses are delivered at irregular intervals, according to the demands or the presence of students of sufficient advancement.

LECTURES

1. Dynamics. General Principles, Equations of Lagrange and Hamilton, Methods of Hamilton and Jacobi. Systems of Particles, Rigid Bodies.

This course is fundamental for the pursuit of all the others, and includes a detailed account of the principle of Least Action and the differential equations of Lagrange, preparatory to their application to other parts of mathematical physics such as optics and electricity.

2. Newtonian and Logarithmic Potential Functions, Attraction of Ellipsoids.

This course is a necessary preliminary to the study of electricity and magnetism, of hydrodynamics, and of the figure of the earth.

3. Elasticity, Hydrodynamics, Wave and Vortex Motion, Dynamical Basis of Sound and Light.

This course is the basis of applications of the theory of wave motion to sound, light, electro-magnetism, and earthquake waves, and to the study of meteorology.

3a. * Dynamics of Cyclic and Oscillatory Systems, with Applications to the Theory of Electricity, Sound and Light.

The substance of the preceding courses is contained in Professor Webster's Treatise on Dynamics, B. G. Teubner, Leipzig.

3b. * The Theory of Resonance with Applications to the Measurement of Sound and to Wireless Telegraphy.

This course takes up Professor Webster's original researches in acoustics, and also shows how the methods there employed bear on the fundamental electrical phenomena involved in wireless telegraphy.

4. Electricity and Magnetism. The Classical Theories and the Theory of Maxwell, with an account of the principal methods for the solution of problems and applications to absolute measurements.

The substance of this course is found in Professor Webster's Mathematical Treatise on the Theory of Electricity and Magnetism, London, Macmillan & Co.

4a. * Recent Developments in Electrical Theory, including the Theory of Lorentz and the Principle of Relativity.

The application to the theory of electrons and to the optics of bodies in motion.

5. The Theory of Light. Propagation of Light, Diffraction, Reflection and Refraction, Dispersion, Double Refraction, Polarization, Metallic Reflection, Magneto-optics.

5a. * Comparison of Theories of the Ether.

Critical and historical examination of the various mechanical explanations of the luminiferous ether, including those of Green, McCullagh, Kelvin, Maxwell, Sommerfeld and Larmor.

5b. * Geometrical Optics. Properties of Systems of Rays, and their Various Aberrations. Hamilton's Characteristic Function or Eikonal. Applications to Optical Instruments.

6. Thermodynamics. Thermo- and Electro-Chemistry.

The establishment of the two laws of thermodynamics, and their application, by means of the methods of Gibbs and Helmholtz, to the examination of physical and chemical phenomena. Application to heat-engines, including steam, gas, and oil engines, the flow of gases and vapors, and the steam turbine. The conditions of chemical equilibrium, phenomena of electrolysis, osmotic pressure, and capillarity.

7. The Kinetic Theory of Gases. The Maxwell-Boltzmann Theorem and the Elements of Statistical Mechanics.

8. * The Theory of Radiation and of a Black Body.

The relations obtained from the laws of Kirchhoff, Stefan, Wien, and Planck, by the recent applications of thermodynamics.

9. * The Phenomena of Conduction of Electricity in Gases, and of Radioactivity, and their Bearing on the Structure of the Atom.

10. The Partial Differential Equations of Mathematical Physics.

Laplace's Equation, Equation of Thermal and Electrical Conduction, Equation of Wave-motion, Helmholtz's Equation, Lorenz-Beltrami Equation, Telegrapher's Equation, and their special cases; methods of

Cauchy, Green and Riemann; Normal functions, Developments in Series, Fourier's Series, Legendre's, Laplace's, Bessel's and Lamé's functions.

This course is one of the most important for the physicist, and treats a great variety of subjects from the most varied fields, grouping them all into a connected system, and embracing all the methods of theoretical physics.

11. * The Elements of Integral Equations, and their application to Mathematical Physics.

12. * Selected Chapters in the Application of Theoretical Physics to Cosmical Phenomena. including Problems in Geodesy, the Tides, Meteorology, Seismology, and Terrestrial Magnetism.

13. * Linear Differential Equations.

The applications of the theory of functions to the linear differential equations of the second order which arise in mathematical physics.

14. * Orthogonal Surfaces and Curvilinear Coördinates and their Applications.

The courses for 1913-14 will be 5, 5a, 6, 7, 10, 11.

In addition to the above formal courses there is held a weekly Colloquium, or meeting for the informal discussion of subjects not treated in the lectures, and for the presentation by the students of reports on important articles appearing in the journals. A part of the work of the colloquium consists in the systematic presentation of certain classical researches, more or less connected with the lectures, in preparing which the students make use of the original sources of information, thus gaining much acquaintance with the methods of the masters in research. The work of the colloquium has an excellent effect in training students to present their ideas in a systematic manner before an auditory.

Among the various lines of investigation now attracting the attention of the physicists the following are preëminent in importance. First, the interrelations between the luminiferous ether and ordinary matter, and the modifications necessary to be made in Maxwell's theory in order to explain the known optical and electrical phenomena of bodies in motion, and that aspect of the theory which deals with the properties of the small electric bodies known as electrons. This portion of mathematical physics is extremely new, and has hardly begun to appear in university courses in this country. Second, the structure of the atoms of matter, to which the subjects of

spectroscopy and the new and fascinating field of radio-activity give the most promising clew. Third, the thermodynamics of radiation in general, which is most intimately connected with the first, and about which a similar remark may be made as to the lack of instruction.

Of branches of applied physics now awaiting the attention of the mathematical physicist may be mentioned meteorology, seismology, and geophysics in general, in all of which the accumulation of experimental data is ahead of the development of theory, to such an extent in meteorology that Professor Arthur Schuster has said that it would be advisable to suspend all meteorological observations for the next ten years, until the theory should have in some degree caught up with the mass of information already accumulated. The theory of meteorology depends on complicated applications of hydrodynamics and thermodynamics; so as to make great demands upon the mathematical physicist, but the field is a rich one to him possessed of the skill to cultivate it. The study of earthquake phenomena is one that is now becoming of great importance in this country, while the investigation of terrestrial magnetism has lately made great advances.

It is almost obvious to the trained investigator that no one can expect to become a physicist of the first rank without a thorough training in mathematical physics, as without that the results of experiment will never be collected into a coherent system worthy the name of an exact science. Furthermore all mathematical physics must rest upon mechanics, the principles of which are of an importance transcending that of any other branch of natural science. It is for this reason that the courses in physics in this department begin with mechanics, and are developed progressively in a systematic manner. They have the advantage of having been deliberately planned for the needs of students of pure physics, as experience has shown them to be prepared by the various colleges, and of

being all delivered by the same person, so that logical consistency and continuity of method are assured. The waste of time often incurred by repetitions of the same subject and of changes of notation by various instructors is thus totally avoided. Attention is called to the fact that no branch of physics is left unprovided for in the course of lectures.

The aim of the department is to insure in its students some acquaintance with all the various fields of experimental physics, to develop in them the power of exact measurement, to accustom them to exact reasoning from experiment to theory, and to encourage original research conducted on a sound basis. To this end students will be put to work in the laboratory upon experiments of sufficient difficulty to give them skill in measurements of precision, and to enable them to become familiar with the precautions and corrections necessary to be employed in exact work. After a sufficient amount of experience has been gained, and the student has shown himself to be possessed of sufficient originality to warrant independent investigation, he will be encouraged to take up for himself an original research in the hope of making a personal contribution to science. In this research he will have at all times the benefit of the direction and advice of the professor.

It should be urged upon intending students to prepare themselves, not only in ordinary laboratory measurements, but also in mathematics, the lack of proper mathematical preparation being a serious drawback to the appreciation of the lectures. In particular may be recommended for study not merely those portions of the calculus which deal with the working out of many indefinite integrals, etc., but the theoretical portions which deal with the ideas of partial derivatives, definite integrals, and their practical manipulation, together with enough analytic geometry to involve the properties of lines and *surfaces* of the second order, and a fair amount of the elements of determinants. As suitable text-

books for preparation may be recommended to the student Lamb's, Osgood's or Gibson's Calculus, C. Smith's Analytical Geometries, and Muir's or Hanus's Determinants. Appell, *Elêments de l'analyse mathêmatique* may be very strongly recommended to the intending student for study before and during his course at the University.

It cannot be too strongly urged that the student should, from the beginning, be able to read French and German with ease and to make use of works in them.

REQUIREMENTS FOR THE DOCTOR'S DEGREE

1. The ability to read at sight specimens of scientific French and German, tested before the first of November preceding the Doctor's examination by a committee of two members of the Faculty.

2. The successful passing of an examination upon the general subject of Experimental Physics[1] and upon the subjects named above in the regular course in Theoretical Physics, as a major requirement, together with an examination in one minor subject, *to be determined in each particular case by the head of the Physical Department.* This subject will be Mathematics or Chemistry.

3. The presentation of a satisfactory dissertation, involving a substantial amount of original work, and forming a contribution of value to pure science. The presentation of the dissertation is a prequisite to examination. The time of residence necessary for the proper fulfilment of the above requirements will generally be at least three years, of which at least one will be very largely devoted to work on the dissertation. Students will not be encouraged to enter upon the work of a dissertation until they have acquired sufficient experience to enable them to specialize with advantage.

The aim of the department is to produce physicists rather than electricians, acousticians, opticians, engineers, or narrow specialists of any sort, for although in the nature of things one will be obliged to know more of one subject than of others, yet it seems evident that no thorough knowledge of any branch can be gained without a comprehensive view over the whole subject. Without this the specialist, or the experimentalist lack-

[1] Every student is recommended to provide himself with Winkelmann's *Handbuch der Physik* as a work for continual reference.

ing a knowledge of mathematics, will continually be falling into pitfalls which the more wary avoid. Furthermore it can be but a detriment to science to encourage research in new fields by immature and ill-prepared minds and hands.

The following statement is here inserted for the benefit of students of mathematics.

The minor in Mathematical Physics consists of the subject-matter of courses 1, 2, 3, and 10, which are intended to constitute the equivalent of five hours a week for one year. Course 10 is given in alternate years to the other courses. The subject-matter of the course is contained in Dr. Webster's treatise on *Dynamics* and his work on Partial Differential Equations, now in press.

THE LABORATORY

The laboratory occupies three floors of one wing of a large well lighted building free from disturbances, and admirably adapted to the purposes of a physical laboratory. On the ground floor is a room extending across the end of the building forty-five feet long by twenty-two feet wide, with windows on three sides, above which are three similar rooms. A lift running from the bottom to the top floor affords means of transporting apparatus, while its shaft furnishes space for manometer or barometer tubes. In the lower room are four piers with heavy stone tops, and two others below the floor on which can be placed heavy tables.

Also on the ground floor is a large dark room, partially below ground, in which the temperature is tolerably constant, containing a very large and heavy pier. The engine and storage-battery room contains a kerosene engine and dynamo on the same foundation and sixty storage cells of ten amperes capacity, constituting the power-supply. The engine may be started at a few moments notice, even at night, but has

been superseded for most purposes by a motor-generator which is driven by an external supply and furnishes all needed direct current. The storage cells are conveniently arranged so that each one is accessible from each side, from above and below, and the ventilation is excellent, while the room is as light and clean as the work-rooms. Distributing switchboards allow the current from the dynamo or any section of the battery to be supplied to any of the rooms. On the same floor are three rooms constituting the workshop, one of the most important parts of a research department of physics. The first room is devoted to wood-working and pattern-making, and accommodates also a bench for soldering. The next room contains the machinist's bench, two engine-lathes and planer, and the third room a Rivet precision bench-lathe, jeweller's lathe and drill-press. There is no countershafting in the building, each tool being driven by a separate electric motor, so that perfect quiet and steadiness are ensured. In the shop are executed all repairs and alterations of apparatus, and the new apparatus requiring continual experiment is constructed. Most of the principal pieces of apparatus belonging to this department have been thus constructed. In this manner, by having a mechanic always present, an extremely great economy in time and money is effected, and vexatious delays, which would otherwise completely arrest the progress of the work, are avoided. Facilities and encouragement are given to the students to construct apparatus for themselves.

On the main floor are the lecture room, the director's office, the large room used as the director's private laboratory and apparatus room, and three other convenient rooms for research. Two of these are arranged so that they may be darkened for photography, and are also fitted with chemical hoods. The large room on the top floor is diagonally di-

vided into two, one dark and devoted to the Rowland twenty-foot diffraction grating, and with a photographic dark room attached. The second is utilized for work in sound. Every room in the laboratory contains sinks, gas and electric light connections, and several circuits connecting with the switch-board in the battery-room.

The laboratory is well equipped with apparatus for research, besides having the facilities above described for the construction of instruments of any sort needed for that purpose. In addition may be mentioned a large collection of diagrams illustrative of mathematical physics, many of them being originals of the figures in Professor Webster's "Electricity and Magnetism" and "Dynamics," and a number of interesting models used in teaching dynamics, thermodynamics, and electricity. Among them are Maxwell's Dynamical Top and a number of other interesting tops, Maxwell's and Rayleigh's induction models, Gibbs's, van der Waals's and other thermodynamical surfaces. This collection of drawings and models can probably not be matched in this country, and is continually being increased.

The laboratory affords so much space that it is rarely necessary to put more than one student in a single room. Every student receives personal attention in the laboratory from the professor whenever he needs it, and is continually in receipt of instruction and suggestion by personal contact, the best form in which information can be imparted. Emphasis should be laid on the advantage to the research student of the contact with a professor who has no other duties or interests than the furtherance of research, in an institution devoted to this as its main object.

THE LIBRARY

In the library Clark University has one of its strongest features. With a large separate building, administered in

the most liberal manner with a view to the advantage of the research student, and with ample funds for the purchase of books, its facilities in the Department of Physics can hardly be surpassed. It may be said to contain all of the most important works in many languages, and is continually kept up to date, any book wanted needing only to be mentioned to be procured. The library is particularly rich in journals, among which are included the transactions of the learned societies of England, France, Germany, Italy, Austria, Holland, and Belgium. Other sets are being continually added. A list of journals will be found on pages 50–55. There are few subjects connected with physics which may not be thoroughly studied in this library.

III. CHEMISTRY

Within the past few decades chemistry has been gradually passing from the larval state of a descriptive science into a higher state of development, the theoretical state. This transition has given to the ancient science, not only a new beauty and usefulness, but also an amazing *will to grow*.

Some liken the new chemistry to a tower in the earliest stages of construction, with a host of men swarming on the scaffolding, engaged in adding stone after stone to the promising structure.

From the pure science this intense constructive activity has spread, as might be expected, to the applied branches, notably the American chemical industries. Where twenty-five years ago the chemist was employed, and allowed, to do nothing but routine testing, to-day research laboratories are in active operation, whose members are expected to invent, develop, or improve something somewhere in the processes of manufacture. American enterprise has discovered a way toward the highest utilization of the country's wealth in setting trained ingenuity at work in chemical research laboratories.

The equipment of the industrial chemist, as well as of the competent teacher, must consequently consist, not so much in a memorized collection of formulae and processes, or of heterogeneous information in the chemistry of the manufactures, as in a clear critical understanding of the principles of pure chemical science and in some experience in grappling with difficulties. The desire for *such* knowledge, and the courage and perseverance necessary in attacking problems,

are acquired only through research. And hence *a department of chemistry, particularly a graduate department, must be primarily a department of chemical research.*

With this principle in view, the activities of all members of this Department, both instructors and students, are devoted mainly, almost entirely, to research. The number of lectures is reduced to a reasonable minimum. Students take up research from the first day of their residence in the Department, and are directed to devote about one-quarter of their time to all scholastic work combined, and the remaining three-quarters to research. The investigations in which they are expected to engage are, as a rule, extensive in scope and occupy two years at least, in some cases three years or more. This makes it possible for the student to found his Doctor's degree, not on a perfunctory dissertation, but on a study and contribution that will give him scientific confidence for years to come.

Even the lecture courses, instead of forming descriptive presentations of existing chemical knowledge, are conducted, as far as possible, on a research plan. In the first place, the material of the lectures is derived, not from text-books, but from the original literature, and the student is constantly referred to original communications for accessory study. Then, each topic is approached by the lecturer, not as a chapter in a book, but as a problem in nature. The topic is introduced by an estimate of its importance and of its bearing on other problems. This is followed by an account, on the historical plan as far as possible, of the extent to which the problem has been solved, of how this was done, and of how much is not yet solved, with suggestions as to practical methods by which solution might be obtained. It is believed that such *critical mode* of study is the true characteristic of university work; perhaps the only characteristic that can keep university lectures from forming a continuance

of the teaching of the lower schools, which often permanently impairs the student's most precious possession: his inherited creative instinct.

Specialized courses are offered on topics of history of chemistry, chemical dynamics, heterogeneous equilibria, organic synthesis, stereo-chemistry, electro- and thermo-chemistry, applications of thermodynamics to chemistry, etc., and the student is expected to attend them regularly. To aid students not quite prepared for work of this kind, simpler lecture and laboratory courses will be offered in general inorganic chemistry, organic synthesis and analysis, physical chemistry, etc.

Part of the scholastic work of the Department consists in Colloquium exercises, students and instructors alike presenting accounts of current chemical research or, at times, delivering formal lectures on classical achievements of the past, or on the life and life-work of celebrated masters of chemical research.

Finally, several times in course of the academic year (but not oftener than once a month) lectures will be delivered here by active chemical investigators from other institutions—lectures dealing generally with the aims and methods of their own investigations. The Department expects much stimulus from such occasional contact with brilliant and hopeful scientific men.

The research work conducted in the Department runs mainly along the following lines: 1. Experimental and theoretical study of the deviations of fact from accepted principles of *general chemistry;* 2. Experimental study of organic substances and reactions from the standpoint of chemical statics and dynamics: *physico-organic chemistry*. Of course, promising investigations may be taken up, from time to time, along other lines as well.

Instead of more or less insignificant pieces of work being

"assigned" to students for their first experience in research, they will be made, if they desire it, *collaborators* of their professor in his own investigations (unless, indeed, they bring forward practicable research projects of their own). Nothing could more certainly assure constant and intimate contact between professor and student and the student's really receiving the best that the Department can offer: individual guidance.

REQUIREMENTS FOR THE DOCTOR'S DEGREE

Strictly speaking, there are no formal "requirements" for the Doctor's degree in this Department. The general University Faculty expects in all cases one year's residence. Otherwise the Department is entirely autonomous in its organization of the training for the degree and in its final estimate of the candidate's maturity. *This imposes upon both instructors and students the duty of zealously guarding the honor of the degree and of maintaining in the Department the highest attainable intellectual standard.*

The time necessary to qualify for the degree of Doctor of Philosophy will depend in each case partly upon the ability of the student, but mainly upon the exigencies of his investigation. Three years will not be too long in most cases.

If the student does not possess, at the time of his joining the Department, a good reading knowledge of both German and French and a working knowledge of analytical geometry and the calculus, he ought to acquire such knowledge as early as possible. Experience shows that students learn a considerable amount of mathematics through the special course in chemical mathematics offered here, and also through the courses in physical chemistry. The Colloquium work invariably leads to improvement of the student's knowledge of languages.

The student is advised and expected not to neglect any one of the great branches of modern chemistry by "majoring" in one of them and "merely minoring" in the others.

The examinations for the degree will consist, on the one hand, in a series of partial tests distributed throughout the candidate's period of residence and, on the other hand, in a general final examination in the several branches of chemical science, including organic and physical chemistry, and chemical statics and dynamics; also in one minor subject *to be determined in each case by the Head of the Chemical Department.*

But the real basis upon which the degree will be conferred will be a dissertation forming, in the opinion of the Head of the Department, a genuine contribution, either purely theoretical or experimental, to chemical science.

If a candidate shall have shown in his research signs of true originality of thought, the Doctor's degree will be conferred upon him *cum laude.*

THE MASTER'S DEGREE

The University does not require an original scientific contribution in connection with the Master's degree. In this Department an applicant is, accordingly, offered free choice between founding his degree on research or on purely scholastic work. It is a pleasure to record that as yet applicants have invariably chosen the former, in spite of being warned that research is uncertain of outcome and more difficult, and might prolong to two years the time necessary for the attainment of the degree.

In the scholastic exercises no qualitative distinction is made between work for the Master's and that for the Doctor's degree in chemistry. The former degree is considered a stepping-stone to the latter.

1. Stoichiometry, Mondays and Wednesdays, throughout the year. Dr. Rosanoff.

2. Organic Stereo-Chemistry, Tuesdays, throughout the year. Dr. Rosanoff.

3. Higher Mathematics for Students of Chemistry, Tuesdays, Wednesdays, and Fridays, throughout the year. Dr. Story.

4. Colloquium, Tuesdays, at 4 p.m. Once a week during one part of the year, twice a week during another part.

ONE CANDIDATE'S EQUIPMENT

In order to give anyone who may be interested some insight into the actual working and results of the arrangements made in the Department, it seemed desirable to make a statement as to the work here of one student, recently graduated:

I. Research

The candidate began his research, dealing with the cause of the relative velocities of certain organic reactions, in October, 1908, and continued the study until August, 1911. The work consisted in precise measurements of reaction velocities, combined with other physico-chemical measurements and preparative organic work. It gave the candidate no little insight into the methods of chemical kinetics and statics.

II. Courses Taken

First Year:

1. The hydro-aromatic series, including the monocyclic and polycyclic terpene bodies (Dr. Rosanoff).
2. Organic stereo-chemistry (Dr. Rosanoff).
3. Special methods of inorganic analysis (Dr. Merigold).
4. Organic synthesis (Dr. Rosanoff).
5. Chemical mathematics (Dr. Story).

Second Year:

6. General and physical chemistry, especially gases, liquids, and solutions (Dr. Rosanoff).

7. Dyestuffs, alkaloids, and polypeptides (Dr. Clark).

8. Inorganic stereo-chemistry; radio-activity (Dr. Merigold).

9. Thermodynamics, with some emphasis on applications to chemistry (Dr. Webster).

10. Supplementary and explanatory course in thermodynamics (Dr. Hubbard).

During his second year the candidate also acted as teaching assistant in organic synthesis in the Collegiate Department (one afternoon a week).

Third Year:

11. The law of mass action in homogeneous systems (Dr. Rosanoff).

12. The phase rule and the law of mass action in heterogeneous systems (Dr. Rosanoff).

13. Constitution of derivatives of benzene, naphthalene, anthracene, etc. (Dr. Clark).

14. Methods of atomic weight determinations (Dr. Merigold).

During the third year the candidate also attended for the second time Dr. Rosanoff's lectures on organic stereo-chemistry and spent a small fraction of his time as Research Assistant in the University Department.

III. Partial List of Papers Reported by the Candidate in Colloquium

1. Jean Rey. "The Increase in Weight of Tin and Lead on Calcination." (Alembic Club Reprints.)

2. Mayow. "Medico-Physical Works." (Alembic Club Reprints.)

3. Priestley. "The Discovery of Oxygen." (Alembic Club Reprints.)

4. Scheele. "The Discovery of Oxygen." (Alembic Club Reprints.)

5. Ipatieff (pyrogenetic researches), *Berichte*, *34*, 596 (1901).

6. Ipatieff (same subject), ibid., 3579 (1901).

7. Ipatieff (same subject), ibid. *35*, 1047 (1902).

8. Perkin and Pickles (synthesis of terpenes), Trans. London Chem. Soc., *87*, 639 (1905).

9. Perkin and Matsubara (same subject), ibid., *87*, 661 (1905).

10. Baeyer (terpenones of the carvone group), *Berichte*, *27*, 1916 (1894).

11. A. A. Noyes (conductivities at high temperatures), J. Am. Chem. Soc., *30*, 335 (1908).

12. A. A. Noyes (conductivity and ionization of polyionic salts), J. Am. Chem. Soc., *31*, 987 (1909).

13. Bredig (osmotic pressure and the Van der Waals equation), *Zeit. physik. Chem.*, *4*, 444 (1899).

14. A. A. Noyes (same subject), ibid., *5*, 53 (1890).

15. Abegg (same subject), ibid., *15*, 254 (1894).

16. Freund, Martin, and Achenbach (action of hydroxylamine on certain derivatives of anthraquinone), *Berichte*, *43*, 3251 (1910).

17. Rabe (on a peculiar connection between the strength and action of acids), ibid., *43*, 3308 (1910).

18. Lecture on the manufacture of essential oils (based largely on Muspratt).

19. Lecture on the Grignard reaction.

20. Account of the life of Lord Kelvin.

21. Account of the life and work of Van't Hoff.

22. Lecture on the results of the candidate's own research.

FACILITIES

The University chemical laboratories occupy a considerable part of the laboratory building. The storerooms contain an unusually large collection of organic preparations, besides all the ordinary inorganic chemicals. The collection of physico-chemical apparatus, including the latest form of Pulfrich's refractometer, an excellent Schmidt and Haensch polariscope, a fine spectroscope, a large Hilger quartz spectrograph, a Burkhardt calculating machine, an Altschul apparatus for measuring critical pressures, specially constructed large constant-temperature stillheads, a set of excellent thermostats, sets of fine thermometers, etc., is sufficient for most ordinary purposes. Whatever special apparatus and chemicals are needed in connection with the work of research are ordered at once, every reasonable effort being made to help the student obtain a maximum of results with a minimum expenditure of time and energy. In this connection it may be mentioned that the Department is at liberty to use the services of the skilled mechanician regularly employed by the Department of Physics. Students will themselves prepare their chemicals, or build their research

apparatus, only in those cases in which the Director may consider such work especially instructive to them.

The Director of this Laboratory is Secretary of the Association of American Chemical Research Laboratories, formed at the second decennial celebration of Clark University in 1909. *Inventories of the more important research laboratories are kept here, and any chemical needed in an investigation, if not in our own stock, is promptly supplied by some other member of the Association.* Such exchange of chemicals by laboratories entitled to duty-free importation has recently been declared by the authorities at Washington to be perfectly legal. It is certainly of the greatest help to members of this Department.

THE LIBRARY

The Library of Clark University has, independently of the other departments, a magnificent endowment of its own. Its chemical collection contains complete files of all the more important journals in English, German, and French, and a rapidly increasing number of general treatises, monographs, and reference works. The income of the library permits of purchasing at once *all* books needed by anyone engaged here in chemical research.

Part of the collection, including the files of the *Zeitschrift für physikalische Chemie*, the *Berichte der deutschen chemischen Gesellschaft*, the *Transactions of the Chemical Society of London*, the *Journal of the American Chemical Society*, the *Chemisches Zentralblatt*, and a number of reference works, forming a small departmental library proper, is kept in one of the laboratory rooms and is accessible to all members of the Department at all times. The departmental library, for the establishment of which the Department is deeply indebted to Dr. Louis N. Wilson, University Librarian, is

one of the most valuable aids in the work of both instructors and students. It will be gradually enlarged.

SCHOLARSHIPS AND FELLOWSHIPS

The Department has at its disposal several Scholarships and Fellowships, which will be awarded each year to the ablest and best recommended applicants. Scholars, and especially Fellows, will coöperate with the Director in maintaining a harmonious and scientific atmosphere in the Department and in promoting all the ends of the University. They will have no duties besides that of making the best use of the facilities for study and research offered to them.

RESEARCHES CARRIED ON IN THE DEPARTMENT SINCE THE INSTALLATION OF ITS PRESENT HEAD, SEPTEMBER, 1907

1. Practical elaboration of a new method for determining the partial vapor pressures of organic mixtures, and determination by means of it of the vapor pressures of a number of typical binary mixtures (published; *crowned by the American Chemical Society with the Nichols gold medal of its New York Section*).

2. A quantitative study of the Victor Meyer Esterification Law and the Steric Hindrance hypothesis (published).

3. A quantitative study of steric hindrances in the esterification of fatty acids (published).

4. Perfection of a precise and rapid method for determining halogens in organic compounds (published).

5. A study of the transformation of aldohexoses into alcohol by ferments, enzymes, and alkalies (uncompleted).

6. A new relationship between the vapor pressures of binary mixtures and a general quantitative theory of fractional distillation (partly published).

7. Experimental study of fractional distillation in the light of the results of the preceding research (ready for publication).

8. A theoretical study of the variation of the vapor composition of binary mixtures with the temperature (ready for publication).

9. A study of the mechanism of iodination in the aromatic series by halogen carriers (uncompleted).

10. A new study of steric hindrances in esterification (ready for publication).

11. A precise quantitative study of the phenomena of direct esterification and ester hydrolysis (ready for publication).

12. A study of the kinetics of certain inorganic reactions (temporarily interrupted).

13. A precise study of the decomposition of tertiary amyl esters (one part ready for publication).

14. A peculiar transformation of benzo-bromamide (temporarily interrupted).

15. An improved method for the preparation of acetamide (published).

16. Definition of an Ideal Gas (in collaboration with Professor Webster; published).

17. A new study of the Duhem-Margules equation (in collaboration with Professor Story; nearly ready for publication).

18. A theoretical revision of some of the principles of the theory of solutions (in progress).

19. A new study of the dynamics of sugar inversion (in progress, two parts published).

20. A rapid method for measuring partial vapor pressures (partly published).

21. Limitations of the constant-temperature stillhead (ready for publication).

22. A study of esterification equilibrium in the gaseous state (temporarily interrupted).

23. An improvement of the preparation of para-nitro-phenol (published).

24. Determination of the relative strengths of organic acids (temporarily interrupted).

25. The working of the constant-temperature stillhead in the case of mixtures with maxima or minima in the boiling-point curves (ready for publication).

26. A new lamp, giving an exceedingly intense monochromatic light (ready for publication).

27. A study of certain reactions and derivatives of fumaric acid published).

28. A rapid method of analyzing ternary mixtures of toluene, ethylene bromide, and carbon tetrachloride (ready for publication).

29. A method of determining the molecular boiling-point elevation of solvents (ready for publication).

30. A study of the influence of solvents on the specific rotatory power of substances (in progress).

31. A theory of homogeneous catalysis (published).

IV. BIOLOGY

The aim of the department is to develop investigators well grounded in the history, principles, problems and methods of modern biological science. Since the first step in any research is a knowledge of all that has been learned on the subject to date, the library of the department has been selected with a view to the best classical monographs, texts, journals and especially complete sets of indexes, Jahresberichte and Centralblätter, from which a complete bibliography of any subject can quickly be obtained. Both lectures and laboratory work in the courses described below are especially designed to facilitate practical acquaintance with the methods and apparatus of research, and, as soon as practicable, each student is expected to begin a piece of original investigation. The laboratories are equipped with standard apparatus of most approved types, and if new work requires specially devised apparatus, every effort is made to obtain it. It is thus the aim of the laboratory to place at the disposal of those interested in the solution of biological, physiological and neurological problems the best possible facilities for the prosecution of their work.

The field of modern biological science is so broad that laboratories as well as men are obliged to specialize. The department has for the past few years undertaken to work out a series of problems in the dynamics of living organisms, studies on the activities of animals and plants. Instead of confining attention to structure and form, the attempt has been made to gain an adequate expression for species as forces in nature. This is distinctly a new point of view,

and when we ask such questions of a species as: What do you do? What is your work in the economy of nature? What is your daily life? Your rhythms of work and rest? Do you sleep? Do you play? Do you adapt yourself intelligently or mechanically to your environment? What relation has your work to human interests? What are the conditions of your highest vigor and efficiency? How will this or that change in your environment affect your life? How do you vary?—when we ask these questions of the commonest species, we find ourselves on new ground, alive with new and vital problems.

In this large field studies of the daily life of a series of animals—amœba, vorticella, hydra, earthworm, crayfish, toad, rat, bobwhite—have yielded most valuable results, and other forms equally interesting await study. Another line which is possibly of even greater promise, is the investigation of the effects of different conditions, foods and drugs, exercise, infections of various kinds, on the vigor of the germ plasm and consequent stamina and viability of offspring. Several researches have been made and are in progress and many more are projected in this field.

It is high time that university biology began to concern itself with problems of the adequate control and protection from extinction of valuable American species. Work on the biology of the ruffed grouse, sharp-tailed grouse and bobwhite has been in progress for several years past, a plan to save the passenger pigeon from total extinction has been developed and, if any still remain, gives hope of proving effective; and plans have been sketched for similar studies on the wood duck and woodcock, two other "vanishing species," prairie chicken, wild turkey, wild swans, geese and other water-fowl, and several species of plover whose extinction is imminent. The biology of all these species, and many more must be worked out in detail so that we can know and teach

generally the conditions under which the perpetuation of each and every valuable American species may be assured.

Along with the above considerable attention has been given to organization of biological instruction through the public schools, high school, college and university.

The above will serve to explain briefly the courses offered below.

1. Dynamic Biology and General Physiology. It is proposed to combine in this course the fundamental laws and principles of biological science, the emphasis being placed on the functional or dynamic side rather than on the side of morphological structure. In other words, the point of view of the course is that living species have assumed certain forms and have developed definite structures in order to fit them to perform a certain work in the economy of nature. The first half-year is devoted to the study of a typical series of animals as forces in nature, special attention being directed to American problems and to the methods and apparatus by which dynamics of species may be investigated. On the side of biological theory, which occupies the last half of the year, among others the following topics will serve to outline the scope of the course. Origin and constitution of living matter. Physiological functions. Classifications of plants and animals. Biological reactions, tropisms, experimental morphology. Differentiation of organs. Growth and reproduction. Heredity. Variation. Dr. Hodge, two lectures weekly, October to June. Laboratory work will be arranged to meet the needs of individual students. 1913–1914.

2. Animal Behavior. This course, the materials for which have been collecting for several years, will deal with the normal, biological reactions of a series of typical animals as a basis for experimental work in comparative psychology. It may also serve to suggest to psychologists many problems both for research and for observational study in the laboratory. On the purely biological side we are beginning to see that control of animal life in all its many phases from domestication of species to extermination of undesirable forms depends for success upon a knowledge of the laws and principles of animal behavior. This phase of zoölogy is thus closely related to the economic and will draw naturally from the researches of the scientific departments of the government, the data of which have never before been gathered together and presented from this point of view. The course will be illustrated

by living specimens, so far as possible, and by a complete series of charts already in the possession of the department. Dr. Hodge, two lectures weekly, from October to February, 1913–1914.

3. Biological Instruction. The aim of this course will be to present the results of the Conferences on Biological instruction held in connection with the Second Decennial Celebration of Clark University, and to develop a plan for the organization of such instruction throughout the entire system of education. It will discuss briefly first biological nature study in the elementary schools, consider the problem of the high school course, the history and development of the college course and close with the history, aims and methods of biological research and its present organization in universities and research institutions. Dr. Hodge, two lectures weekly, October and November, 1912.

4. Special Biological Lectures. In this course all members of the Department are given an opportunity to present in lecture form topics—reviews of books and important investigations and particularly results of their own researches. About one lecture weekly, throughout the year.

NEUROLOGY

It is intended to arrange the course in such a manner that the general field may be covered in two years. This will leave the student free to devote his entire time during the third year to special study in the literature of the science and to the prosecution and completion of his thesis work. Accordingly, a two-year cycle will be arranged as follows:

5. Comparative Study of Nervous Systems and Sense Organs. This course will form the natural anatomical background for comparative psychology and together with the working out of a minor problem may well constitute a minor for one whose major is psychology or philosophy. On the biological side it will be closely correlated with general physiology and morphology. It is intended to begin with a comparative study of structural elements of the nervous system of both invertebrates and vertebrates and then correlate and compare the different degrees of complexity of function with the anatomical organization found in the ascending series. The course will be illustrated throughout by diagrams, models, dissections and microscopical preparations and

experiments. Laboratory work one afternoon weekly, or arranged to meet the needs of individual students. One hour weekly, for general class exercise, or its equivalent.

6. The Human Nervous System and Sense Organs. This course will deal with the embryology, histology, anatomy and physiology of the human nervous system and with the gross and microscopic alterations of the nervous structures in the organic nervous diseases and psychoses. Dr. Orton. *One lecture weekly February to June.*

By way of supplementing the above and courses in other departments of the University, three special courses have been planned as follows:

7. Practical Histology. The course will be a laboratory course, with such lectures, directions and conferences as may be required by those taking it. It will be arranged practically to meet the needs of individual students. Considerable latitude will be given, so that any who wish may make it a comparative study by way of supplementing courses 1, 3, 5 or 6, prepare a series of demonstrational specimens for themselves, or devote their time to special problems.

8. For those who do not take work in the laboratory, but desire to see the actual specimens and experiments, a course of demonstrations to run somewhat parallel with the above courses will be offered. One hour weekly, through the year.

EXPERIMENTAL WORK

Laboratory work in biology, physiology, histology, and neurology is arranged to meet the needs of individual students. In case one has not decided on a special line of research, the resources of the department are such that he will be given a fairly wide range of problems from which he may select a subject suited to his tastes and attainments. A course in biology such as is given in our best colleges and State universities is sufficient to enable students to begin work here.

A long-felt need of the department is now supplied in the possession of land well adapted and conveniently located for biological research. Ideal facilities can now be offered for

the study of daily rhythms, life and work of species under natural conditions; and also for experiments in animal and plant breeding. It is proposed to organize an extended series of researches upon the effects of different chemical substances and conditions of life upon the viability and vigor of the germ plasm.

While no regular laboratory fees are charged, each student is expected to refund to the laboratory the cost price of all the more expensive reagents, including alcohol, ether, chloroform, formalin, celloidin, and the like. Each student must supply his own microscopical glass, slides and covers, and must pay the cost price of all glassware that he breaks. All students are expected to take the best possible care of all apparatus entrusted to their charge, and to return it to the laboratory clean and in good order.

The Journal Club meets weekly, for the purpose of reporting and discussing important articles in the current periodicals.

The Biological Seminar devotes one evening weekly throughout the year to special papers upon topics in the historical development of the science and to the reading and discussion of classics in biological philosophy and research.

V. ANTHROPOLOGY

DR. CHAMBERLAIN will lecture twice a week throughout the year. The courses offered endeavor to cover the following field:

GENERAL ANTHROPOLOGY, embracing: (a) History, scope and relations of the science. (b) PHYSICAL ANTHROPOLOGY; problems, investigations, results, laboratory work. (c) ETHNOGRAPHY; races and race-origins. (d) ETHNOLOGY, INCLUDING SOCIOLOGY; origins and development of the arts and sciences, institutions, ideas and ideals of man and the races of man, human civilizations, their origin and development. (e) MYTHOLOGY; folk-lore, religions. (f) LINGUISTICS; race and language, origin and development of language and of languages, psychology of language, gesture-speech and written language, comparative linguistics, comparative literature. (g) CRIMINAL AND PATHOLOGICAL ANTHROPOLOGY; physical and mental; ethnic morals. (h) HISTORICAL AND ARCHEOLOGICAL; primitive man and primitive culture, the precursors of man.

SPECIAL ANTHROPOLOGICAL TOPICS most akin to Psychology and Pedagogy, embodying the results of the most recent and important studies and investigations of the following and other subjects, particularly: The Characteristics in the Primitive Races and their Rôle in Human History; The Physical Anthropology of Infancy, Childhood, Youth, Manhood, Old Age; the Anthropological Phenomena of Growth, Arrested Development, Degeneration; Anthropological Aspects of Heredity and Environment in the Individual and in the Race; Uncivilized Races and Civilized Races; the Phenomena of Race-Mixture; the Evolution Problems of Humanity; Education among Primitive Peoples; the Anthropological History of America; the Interpretation of Folk-Lore; the Psychology of Primitive Peoples; the Trend of Human Progress; the Psychology of Primitive Languages; the Mind of Primitive Man and its Expressions; the Development of Human Personality; the Rôle of the Individual in Primitive Culture; Progress and its Criteria; the Orient and the Occident in their Relations to Human Evolution; the Negro in Africa and in Amer-

ica; the American Indian; the Anthropology of Japan and China; "World Languages" and "World Culture."

The lectures in Anthropology will have special bearing upon the courses in Psychology and Pedagogy in the University, and every effort will be made to utilize the latest results of Anthropological investigations.

From time to time, the most valuable current literature will be reviewed and students made acquainted with the best contributions to Anthropological Science in the various foreign languages. An annotated Bibliography of the "Periodical Literature" of Anthropology, by Dr. Chamberlain, is published quarterly in *Current Anthropological Literature.* Reference may be made also to the article on "North American Indians," in the new (eleventh) edition of the *Encyclopedia Britannica* for orientation concerning one of the primitive races of man. The importance of a thorough acquaintance with the bibliography of their subjects is impressed upon all students, and all possible assistance in this direction is always at their disposal.

VI. PSYCHOLOGY

A complete course in Psychology at Clark University includes the following subjects:

1. Anatomy and Physiology of the Brain and Spinal Cord, sense organs, and other parts of the body, especially the muscles—the organs of the will—in so far as they are concerned with mental processes,—together with a good general background of biology. For this a special laboratory is equipped. See Dr. Hodge's announcement.

2. Physiological and Experimental Psychology, including an outline of the anatomy and physiology of the central nervous system and sense-organs; the elementary sense-experiences; sensation and perception; the measurement of sensational intensity; space; time; reaction-times; affection and emotion; memory; association; attention; apperception; will; the "higher mental processes;" inter-relation of mind and body. For this a special laboratory is equipped. See Dr. Baird's announcements.

3. Comparative and Genetic Psychology. Review of the general doctrine of evolution as a basis for the evolution of mind. Discussion of experimental and observational studies upon typical forms of animal life, beginning with the protozoa. Instincts; animal and human infancy. Childhood and adolescence. See announcement of Drs. Hall, Baird and Porter.

4. Abnormal and Morbid Psychology, as nature's experiments, *e. g.*, border-line phenomena as seen in neurotic subjects, prodigies, and geniuses; defectives, such as the blind, deaf, criminal, idiotic; mental and nervous diseases, epilepsy, phobias, neurasthenia, hysteria; morbid modifications of will, personality and emotion, etc. Special clinical facilities for this work are open to the department in the hospitals and other institutions of the city. See Dr. Hall's lectures and Dr. Cowles' lectures and clinic.

5. Anthropological Psychology; myths, customs and belief, comparative religion and psychology of religion, primitive art, and the study of the life of savages and children; adolescence and senescence; physical

measurements illustrating laws of growth in size and power, etc. See Dr. Chamberlain's courses.

6. Æsthetics and Ethics, the psychology of music, painting, literature, the phenomena and laws of volition and morality.

7. History of Psychology and Philosophy, including the chief culture institutions, science, medical theories, Christianity, and education generally. Dr. Hall's historical courses and seminary.

8. Applications of Psychology, Pedagogy, including mental and moral hygiene and regimen, school organization and methods from kindergarten to university; the sex problem; defectives, etc. Dr. Hall's and Dr. Burnham's courses.

9. The Psychology of Sex; lessons from the aberrations of this instinct; some of its normal phenomena; the current theories; psychic differences between men and women; education of girls; fatherhood, motherhood; instruction of the young in matters pertaining to sex; theories of Freud, Moll, Ellis, etc.

10. The Psychology of Border-Line Phenomena, including spiritism, telepathy, hypnotism, dreams, multiple personality, somnambulism, crystal gazing, dousing, mind reading, sleight of hand performances, major symptoms of hysteria, psychotherapeutics and mind cure, methods of psychological analysis, etc.

The aim of the Psychological department is to cover this field as well as its instructors are able to do so in two or three years.

The following courses are announced for the academic year 1913–1914.

DR. HALL'S COURSES

Dr. Hall expects to give the following courses next year, although variations from this programme may be made if there is reason to believe that the greatest good of the greatest number of students will be thereby promoted:

1. The Psychology of the Feelings and Emotions. This course will involve a brief sketch of the history of the theories in this field and a much more extended account of the recent experimental, clinical and genetic work done in this department. The purpose of the course is to give a clear account of the present condition of our knowledge of each of

the feelings, one after another, pleasure and pain, fear, anger, sympathy jealousy, love, hate, etc.

2. Psychogenesis. This course will begin with an account of the theories of the origin both of life and of mind, with chief emphasis upon the latter. There will be a survey of the results of experimental biology, concerning elemental life or substances that resemble it, then experiments and observations upon the simplest organisms. This will be followed by a résumé of our knowledge of certain typical forms of animal instinct up the series, and upon this basis the contributions to paleontology will be drawn upon and certain lessons as to the development of the instinct of type forms of life; the horse, camel, monkey and other typical forms will be dwelt upon at some length. This will be followed by a brief account of culture stages of the human race from the paleolithic age and that of the troglodytes up.

3. The Unconscious or the Subconscious. This course will begin with a brief outline of the theory of consciousness and unconsciousness and the place of each and their relations, and will then pass to the subjects to be chiefly considered, viz., dreams and their recent studies; hysterical phenomena; the teachings of Janet, Freud, Jung; psychoanalysis; individual psychology, particularly that of temperament and character.

4. Some Vital Problems in Education. This course will be given Saturdays for teachers and the special field it covers will be announced later.

5. The Seminary, at Dr. Hall's house, three hours every Monday evening through the year.

6. Researches with individuals on special topics.

EXPERIMENTAL PSYCHOLOGY

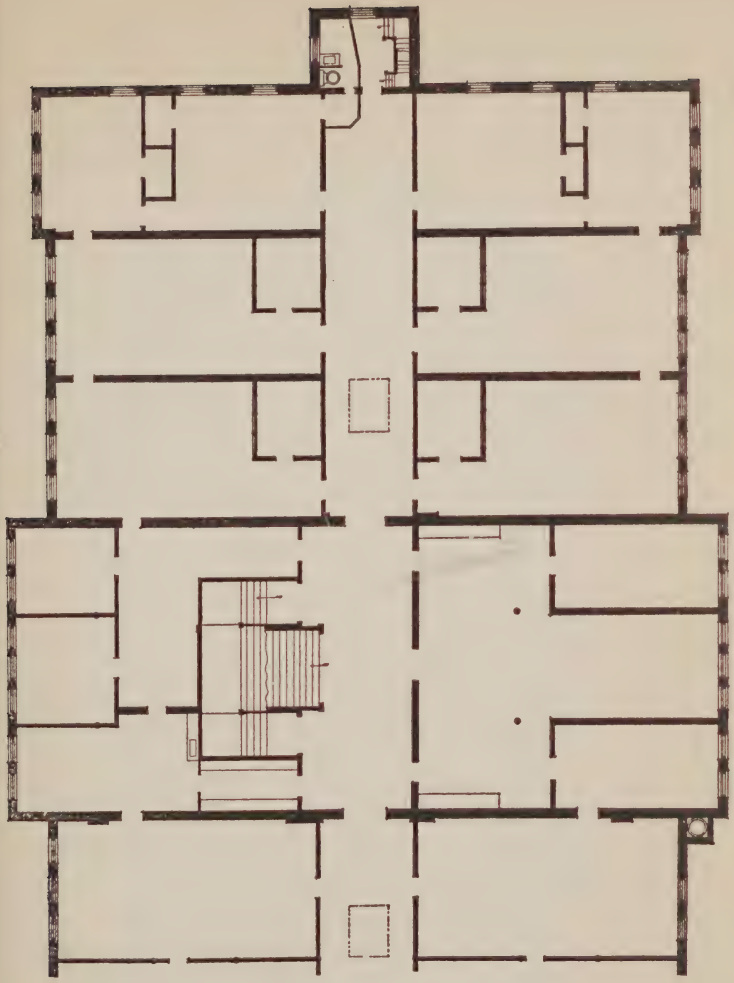
The primary purpose of this department is to train students for the investigation of psychological problems. The lecture courses and the Journal Club aim to familiarize the student with the history and the present status of psychological experimentation; the laboratory courses are arranged with a view to training him in experimental procedure, and equipping him for independent research.

The psychological laboratory occupies a suite of twenty rooms on the upper floor of the main building of the university. These rooms, as at present arranged, are devoted to the following purposes: office, lecture-room, seminary and reading-room, dark-room, work-shop, general apparatus-room, and a group of rooms for research.

The laboratory is well equipped with general apparatus; and it has an annual appropriation sufficient to provide for the purchase and manufacture of such apparatus as is required from time to time for special investigations. The work-shop contains power- and other lathes, a power-drill, and an abundant equipment of tools and materials for the manufacture and repair of apparatus. The services of an expert mechanician are available; and every facility is provided for the devising and constructing of apparatus appropriate for the solution of such special problems as are undertaken.

The library contains an unusually large collection of psychological literature. It is especially well supplied with scientific periodicals and proceedings of learned societies. Since the enrolment of the department consists exclusively of graduate students, and is, therefore, relatively limited in numbers, it is possible to give to each student of the department a maximum of freedom in the use of the library. Besides having access to the university library, students of the laboratory have at their disposal an excellent working-library of psychological books and periodicals which are shelved in the seminary-room.

The more general and fundamental courses of lectures in the department are repeated each year, while the more advanced and specialized courses are given only in alternate years. A feature of the method of instruction at Clark University is the frequent informal conferences between in-



PSYCHOLOGICAL LABORATORY

structor and student. The Journal Club meets weekly (two-hour sessions) for the discussion of the current literature. The more valuable contributions presented by the members of the Club will be published in the *American Journal of Psychology*. The laboratory work includes an introductory and a research course. The former is designed to familiarize the student with the efficient handling of apparatus, and to acquaint him with the methods to be followed and the precautions to be observed in psychological experimentation. This course is repeated each year; it, or its equivalent, is a prerequisite to all other work in the laboratory. The research varies from year to year.

Provision for Comparative Psychology is now made at the Hadwen Arboretum, about fifteen minutes' walk from the main building of the University, where special facilities for the care of the animals have been provided.

DR. BAIRD'S AND DR. FERNBERGER'S COURSES

1. General Psychology. A course of lectures and demonstrations dealing with sensation, affection, attention, volition and perception. This course will present, in concrete and systematic form, the more important facts that have been yielded by the experimental investigation of the simpler mental processes, together with a discussion of theories that have been advanced from time to time. Dr. Fernberger. *Two hours a week. First semester.*

2. The Application of Statistical Methods to Psychology A course of lectures and demonstrations in which will be considered the calculations necessary for the practise of the psychophysical methods and also the relation between the methods. The distribution of relative frequencies, correlation and similar topics will also be considered. Dr. Fernberger. *One hour a week. Second semester.*

3. The Psychology of Memory, Imagination and the Process of Learning. Lectures and demonstrations dealing with the phenomena of mental acquisition and retention; imagery, association and reproduction, the phenomena of learning and forgetting, the function and development of habits. Dr. Baird. *Two hours a week. Second semester.*

4. The Psychology of the Higher Intellectual Processes. The psychology of meaning, abstraction, thought, judgment, reasoning; the function and significance of imagery; the phenomena of *Bewusstheit*, *Bewusstseinslage*, *Aufgabe*, *Einstellung* and *determinierende Tendenz*. Dr. Baird. *One hour a week.*

5. Psychological Systems. A statement and discussion of the characteristic features of the systematic doctrines embodied in the writings of representative psychologists, past and present. Dr. Baird. *One hour a week.*

6. Journal Club. A seminary for the informal discussion of current psychological literature. Meetings are held weekly throughout the year.

7. Introductory Experimental Course. In this course the student will perform a series of standard psychological experiments, chiefly for the purpose of mastering the technique of experimentation. The course will be given by Dr. Baird, Dr. Fernberger and Mr. Finkenbinder. *Four to six hours a week, throughout the year.*

8. Research Course. Under this title are grouped the special investigations undertaken by students in the laboratory. *Topics and hours to be arranged.*

Dr. Tsanoff's Announcement of Courses

1. History of Modern Philosophy. A lecture-course dealing with the main currents of philosophical thought since the Renaissance and the dominant tendencies and problems of present-day philosophy. *One hour a week.*

2. Ancient and Mediaeval Philosophy. An historical outline, with reports and discussions of special problems; specially intended as a general review for students wishing to deal in greater detail with particular periods of Greek and scholastic philosophy. *One hour a week.*

3. Post-Kantian Philosophy. A somewhat technical study is attempted of the development of German philosophy during the nineteenth century; special emphasis is laid on the rôle played by the Critical philosophy in the evolution of the modern idealistic conception of Experience. *One hour a week.*

The following courses offered by Professor James P. Porter in Clark College are open to students in the University:

1. General Psychology. Three hours a week, throughout the year.

2. Social Psychology. Three hours a week, throughout the year. Omitted 1913–14.

3 a. The Evolution of Mind and Genetic Psychology. Three hours, first semester.

3 b. Educational Psychology. Three hours, second semester.

4. Laboratory Course in Experimental Psychology. Three hours a week, throughout the year.

At the Hadwen Arboretum, where a "station for the study of animal behavior" has been established and is now under Dr. Porter's direction, are found facilities for the study of certain forms of animal life; and here too will be found some of the illustrative material for his lectures.

VII. PEDAGOGY

This department offers a course which can be taken for the degree of Doctor of Philosophy. Its work is in the closest connection with that of psychology and anthropology, and in part based on these subjects. The work in this department is intended to meet the needs of the following classes of students.

First. Those intending to teach some other specialty but who wish a general survey of the history, present state, methods, and recent advances in the field of university, professional and technical education.

Second. Those who desire to become professors of pedagogy, or heads or instructors in normal schools, superintendents, or otherwise to become experts in the work of education.

The programme of the Pedagogical Department includes courses upon the following subjects:

1. (*a*) Child Study. (*b*) Pedagogical Psychology. (*c*) Experimental Pedagogy. (*d*) School Hygiene.

2. (*a*) Principles of Education. (*b*) History of Education and Reforms. (*c*) Methods, Devices, Apparatus, etc.

3. (*a*) Organization of Schools in Different Countries. (*b*) Problems of College Education. (*c*) The Teaching Profession. (*d*) Motor Education, including manual training, physical education, etc. (*e*) Moral and Religious Education. (*f*) Ideals.

The courses in pedagogy for 1913–1914 will be as follows:

DR. WILLIAM H. BURNHAM'S COURSES

A. Pedagogical Applications of Psychology. Some of the most important chapters in psychology in their educational aspects, such as habit, attention, interest, memory. Such topics as the following are

discussed: The correlation of physical and psychic processes. The child as a reacting organism. The fundamental instincts of children as the basis of apperception and interest; imitation; rivalry; co-operation. Suggestion as a factor in education. Education of the senses. Apperception and association. Defects of memory. Experimental investigations of memory. The learning process. Economical methods of learning. Feeling and interest in relation to instruction and training. Mental attitudes. The training of the will. Mental diseases and the faults of school children. Neuroses of development. Psychological contributions to hygiene. The point of view is that of genetic psychology. *Once a week, throughout the year.*

B. Hygiene of the School Child. This course is supplementary to the course on the Hygiene of Instruction given in 1912–13. Some of the more important chapters in modern school hygiene will be considered, including such topics as: The conditions that determine growth and development. Physiological age. The physical and mental differences between children and adults. The general principles of somatic and mental hygiene. The hygiene of the senses. Modern studies of defects of sight and hearing. School diseases. The hygiene of the voice, the mouth, the teeth, the nose. Tests of ability to work and of physical condition. Medical inspection. The hygiene of discipline. The development of healthful mental activity. The hygiene of memory, attention, and feeling. The hygienic aspects of recent psychological studies. Problems in mental hygiene and the hygiene of instruction. *One hour a week, throughout the year.*

C. Seminary. The work will be determined in part by the needs of the students who elect this course. It will probably be devoted chiefly to genetic pedagogy and to school hygiene. It is hoped, also, that each student will select, after consultation with President Hall and Dr. Burnham, a topic for special investigation. The results of such studies may be published. *One or two hours a week, throughout the year.*

President G. Stanley Hall's Course

Some Vital Problems in Education. See special circular later.

Dr. Edmund C. Sanford's Course

The Problems of College Education. A discussion of the most important questions of college efficiency with

especial reference to present day tendencies and criticisms. *One hour a week throughout the year.*

DR. CAPEN'S COURSE

During the past year Dr. Samuel P. Capen has given a course of lectures on The Principles of School Administration with special attention to the English school system. A similar course devoted to the French and German systems will be given during the academic year 1913–14. *One hour a week, half a year.*

The courses as announced above may be modified somewhat as the needs of the students or other circumstances may require.

THE CHILDREN'S INSTITUTE

The Children's Institute, under the auspices of the Educational Department of Clark University, provides courses of lectures each year upon at least one of the following topics.

(*a*) A general survey of child welfare institutions in this country and abroad with the use of demonstrative material in the form of reports, circulars, etc., by Dr. Theodate L. Smith, who also gives practical aid in the preparation of theses touching this subject.

(*b*) A course on the examination and treatment of subnormal and defective children with clinical demonstrations.

(*c*) A course in experimental pedagogy including the questionnaire and statistical methods and a survey of the history and literature.

The Children's Institute has a large hall with three adjacent rooms, including one entire floor in the new Library Building devoted to an educational museum, which is equipped with hundreds of maps, charts, diagrams, illustrative and other apparatus gathered from many countries, to ease the

work of teaching and make it more effective. This material is used in various departments, but especially by that of Education.

Special attention has been given to the collection of the circulars and other publications of nearly one hundred types of child welfare organizations with which the department seeks to keep in touch.

The library of the department has a large collection of EDUCATIONAL LITERATURE, being especially rich in German and French literature, and having a large number of official reports from various countries—English, French, German, Belgian, Swedish, etc.; also town and city reports, and reports of special institutions; and a collection of French, German, and American text-books.

The books are arranged under the following heads:

1. GENERAL.
2. HISTORY OF EDUCATION.
3. EDUCATIONAL SYSTEMS.
4. THE THEORY OF EDUCATION AND SPECIAL SCHOOL SUBJECTS.
5. EDUCATIONAL PSYCHOLOGY.
6. CHILD STUDY.
7. SCHOOL HYGIENE AND PHYSICAL EDUCATION.
8. TEXT-BOOKS.
9. MISCELLANEOUS.

Many of the more common educational books are accessible in the Worcester Public Library and have not been duplicated by the University. The large collection of educational text-books in the library of the American Antiquarian Society and its valuable historical material are also accessible to the University.

The collection of educational periodicals includes a large

number of the best foreign journals—English, French, German, Swedish, etc.

The nucleus of an educational museum has been formed. This is now merged with the museum of the Children's Institute, and contains a valuable collection of educational apparatus, pictures, illustrative material for language lessons, *Anschauungsunterricht*, toys, kindergarten material, maps, charts, diagrams, text-books, lantern slides, moving picture films, photographs, and illustrative material of various kinds in school hygiene, history, arithmetic, language, the natural sciences, etc. One room contains a collection of apparatus for the teaching of arithmetic, abacuses of various kinds, charts for counting, reckoning machines, number tablets, weights, measures, geometrical models, and astronomical charts and apparatus. Another room contains a collection of toys from different countries, a number illustrating scientific principles in physics and the like. A third room is devoted to apparatus and illustrative material in school hygiene. The collection includes seats and desks, charts illustrating good and bad posture, hygrometers, apparatus for ensuring cleanliness, for testing the air, charts illustrating the incidence of school diseases, the effects of antitoxins, etc. and a collection of the antitoxins for the various diseases. The main room is largely filled with pictures, models, maps, charts, and illustrative material for teaching the different school subjects and the different sciences. A catalogue of the department of School Hygiene in the Museum has just been published. It is hoped that catalogues of other departments will soon be prepared. This museum is open to students, teachers, and others at definite times. It is now under the direction of Professor W. H. Burnham.

The *Pedagogical Seminary* is a journal issued at the University, and serves as a convenient medium of publication for special investigations undertaken in the department.

SPECIAL STUDENTS IN EDUCATION

In addition to the members of the University, special students are admitted during the year to the Saturday courses of Drs. Hall, Burnham and Capen in Education, for a fee of $20.

VIII. ECONOMICS AND SOCIOLOGY

The courses here outlined indicate the scope of the work offered. At least two hours work per week and a seminar are given each year.

1. Recent Economic Theory. This course is devoted to a comparative study of the theories of Marshall, Clark, Böhm-Bawerk, Fetter, Hobson and Carver, as presenting leading types of modern economic theory. The chief emphasis is placed on the problems of value and distribution; on the tendencies toward monopoly and other interferences with normal adjustments; and on the influence of the growth of co-operation and consolidation. This course should be preceded by at least an elementary study of economic theory. *One hour per week.*

2. Principles of Interpretation in Sociology. This deals with the various principles that have been used to interpret history and society. Various viewpoints and principles are taken up in turn, analyzed, their advantages and limitations discussed, and the results achieved by each indicated. Among those studied are: anthropo-geography; the philosophy of history; the great man theory; religion as a factor in social evolution; the economic interpretation of history; social economics; philanthropy; biological and organismic conceptions; the struggle of races; the division of labor; human interests; social control; imitation; social psychology; and like response to stimulus. *Two consecutive hours per week.*

3. Problems of Population. Considers various laws of population as developed by Malthus, Spencer, Nitti and others; vital statistics, birth and death rates, heredity and selection with some attention to statistical methods; theories of racial decay; eugenics and race-regeneration; and biological and sociological conditions affecting the supply of genius. Lectures, reports, discussions. *Two consecutive hours per week.*

4. Seminar. Given to reports on theses and selected portions of the current literature; some special inquiry along sociological lines is also pursued. *Two consecutive hours bi-weekly.*

IX. HISTORY

Dr. Blakeslee offers the following courses:

1. United States History. Different periods are taken for intensive study in successive years. In 1910–11 the course dealt with the history of the United States from the Missouri Compromise to the outbreak of the Civil War, with emphasis upon the years following the Compromise of 1850. It treated especially the institution of slavery as it existed in the Southern States, the origin and growth of the abolition sentiment, the doctrine of states rights, and the development of the antagonism between the North and the South till its culmination in the Civil War. In 1911–12 it covered the period from the close of the Civil War to the present time, and included the economic and social development of the country during these years as well as the history of politics; in 1912–13 it includes the period from the formation of the constitution to the Missouri Compromise. The lectures are supplemented by reports presented by students upon assigned topics. *Two hours.*

2. The Expansion of the United States. The history of the successive territorial acquisitions of the United States is given, including the diplomatic negotiations and the relations with foreign powers. This is followed by a study of the constitutional questions involved, especially those regarding the status of newly acquired possessions and of present-day dependencies; the differences between incorporated and unincorporated territory; and the rights and privileges of inhabitants and citizens of the various lands considered. The aims and the continuity of the American Colonial policy are pointed out. *One hour.*

3. International Law. The aim of this course is to give a knowledge of the general principles of International Law. So far as possible definite cases are studied, and for that purpose Scott's "Cases on International Law" are followed. Especial attention is paid to the legal questions involved in the existing international controversies; to the history and present status of arbitration; and to the modifications in International Law introduced by such international Congresses as those held at the Hague. The study of the leading authorities and of cases is supplemented by lectures and discussions. *Two hours.*

4. English History—The Period of the Tudors and the Stuarts. This course extends from the accession of Henry VII, in 1485, to the death of Queen Anne, in 1714, and deals especially with the establishment of practical absolutism under Henry VII and Henry VIII; the rise of Protestantism; the development of Puritanism in state and church; the great Civil War; Cromwell and the Puritan ascendency; the attempts to form a firm constitutional government; the relation of English Puritanism to that of Switzerland and New England; the restoration of monarchy; and the final triumph of Parliament in the overthrow of James II. Emphasis is placed upon the study of the constitutional documents and other sources. *Two hours.*

5. The History of the Christian Church—From the Days of the Apostles to the Close of the Reformation. The leading topics considered are: the pre-Constantine church, including the persecutions and the formation of a definite ecclesiastical organization; the effects upon the church of Constantine's conversion; the Nicene creed and the early heresies; the conversion of the barbarians and its reflex action upon the church; monasticism; the rise of the Papacy; the mediaeval church at its height; the rise of heresy—Wyclif, Huss, Savonarola; the reformation—Luther, Zwingli, Calvin; the Catholic Reformation; and the religious wars of the sixteenth and seventeenth centuries. *Two hours.*

6. Russia. The lectures discuss particularly the revolutionary movement, including the abuses of autocracy and bureaucracy, the character and methods of the revolutionists, the economic and political ability of the peasants, the widespread acceptance of socialism by the educated classes, the influence of the church, and the recent reforms by the government. *One hour. One Semester.*

7. The Far East. The lectures deal with Russia in Asia; Japan, with its colonies, Formosa and Korea; Manchuria, including the history and present status of the struggle for its control; China and the present revolution; the Philippines and Hawaii; and the International politics of the Far East and of the Pacific Ocean. *One hour. One Semester.*

8. British Colonies and Dependencies. This course includes a survey of the important political, economic and social conditions in the leading British possessions, especially in Canada, Australia, New Zealand, India and Egypt; and a discussion of British colonial policy and problems. *One hour. One Semester.*

9. The Near East and Africa. This includes a discussion of the Balkan situation; the history, the achievements, and the problems of

the Turkish Revolution; the extent and the significance of the political awakening and the religious revival throughout the Mohammedan world; the causes, progress and results of the Balkan-Turkish war; the history of the partitioning of Africa among the European powers; the character of European government in Africa, especially that of the Congo Free State; the results of the Boer war in British South Africa; the nationalist movement in Egypt and the successes and failures of the British administration; the achievements of the native races; and a study of the results and the methods of mission work. *One hour.*

10. Historical Seminar. The students in the Department of History meet once a week in a seminar for the consideration of particular topics of historical interest. Each member is expected to present reports during the year, which then form the basis for a critical discussion. Some of the subjects presented in the past have treated of conditions in India, Tibet, the Congo Free State, Manchuria, Turkey, Russia in Asia, China, Japan, Korea, the Philippines and Egypt.

During the present year, 1912–13, courses 1, 2 and 3 are given.

The most distinctive feature of the work in this Department is the insistence that its students shall obtain a general knowledge of the history of the world as a whole, not merely of the United States and of three or four of the states of Europe. The laws of historical development can be fully understood only after a study of all important peoples, including those in Asia and Africa. Emphasis is placed upon existing conditions, both because these are most vital and because they furnish the richest material for a comparative study of the different stages in the world's political, economic, social and religious advance.

In carrying out these features of its work, the Department has assisted the President of the University in arranging annual conferences for the discussion of the history and the present-day conditions of various lands. In 1909 the sessions dealt with the Far East, including China, Korea, India, the Philippines and Hawaii; in 1910 with the Near East and Africa; in 1911 with Japan and Japanese-American relations; and in 1912 with Recent Developments in China.

Altogether more than one hundred and thirty men have taken part in these conferences,—University professors, anthropologists, leading natives, government officials, travellers and missionaries—all of whom could speak with authority. Their addresses and papers are published by the University in the Journal of Race Development.

LIBRARY

The Library is under the control of a Library Committee, appointed by the Trustees, of which the President of the University is *ex officio* chairman. The duties of this committee are to advise concerning the arrangement, cataloguing, use of books, and other matters pertaining to the Library not reserved to the Trustees nor otherwise provided for.

Library Committee

President G. Stanley Hall, *Chairman*
President Edmund C. Sanford
Professor William E. Story, *Secretary*

Library Staff

Louis N. Wilson, *Librarian*

ASSISTANTS

Edith M. Baker, *Senior Assistant*
Helen J. Elliot, *Cataloguer*
Mary D. Thurston, *College Library*
Beatrice M. Abbott
Elsie L. Basset
Helen F. Gates
Joyce Knowlton
Theodate L. Smith

The Library building is situated on the corner of Main and Downing streets. The Public Opening of the new building was held January 14th, 1904. A full description of the building and of the Proceedings at the Opening will be found in the *Publications of the Clark University Library* for April, 1904 (Vol. 1, No. 3).

The College Library and study rooms occupy the lower floor of the new building, opened in September, 1910, and described in the College Record, July, 1910, Vol. 5, pp. 185-187.

The Library contains about 62,000 bound volumes and pamphlets, and the reading-room receives over 400 journals.

The books are grouped as follows:

A	Works of General Reference	L	Biography
		M	Anthropology
B	Journals	N	Education
C	Mathematics	O	General Science
CD	Math.-Physics	P	History
D	Physics		
DE	Physical Chemistry	R	Political and Social Science
E	Chemistry		
F	Biology, Zoölogy, Botany, Physiology, Neurology	S	English
		T	Modern Languages
G	Geography	U	Classics
H	Pathology	W	Practical Arts
I	Psychology	X	Library Science
J	Philosophy	Y	Art
K	Religious Psychology	Z	Manuscripts

Tuesday and Friday mornings, each week, all books recently added to the library are placed upon a table in the Reference section where they remain for three days. This affords the members of the University and College an opportunity to examine the new books in all departments before they are placed upon the shelves for circulation.

About once a month, during term, by the courtesy of our booksellers, new books are placed for inspection on one of the tables in the Reference section. Any member of the University or College may recommend the purchase for the library of books thus displayed, and such recommendation will receive prompt attention.

All books are classified by the heads of departments and particular attention is paid to the needs of students engaged in research work. The library already possesses a good collection of complete sets of the best scientific periodicals. It makes liberal purchases for individual needs and supplements these by drawing upon the resources of the older and larger libraries through the inter-library loan system. During the past year 588 volumes were borrowed from, and 317 volumes lent to, other libraries. The number of books added each year is about four thousand volumes.

The publications of the Library, edited by the Librarian, and begun in October, 1903, are as follows:

VOL. I.

No. 1. WILSON, LOUIS N.
Bibliography of the Published Writings of President G. Stanley Hall. Oct. 1903

No. 2. WILSON, LOUIS N.
Bibliography of Child Study for the Year 1902. Jan. 1904

No. 3. Proceedings and Addresses at the Public Opening of the Library Building of Clark University, Thursday, January 14, 1904 Apr. 1904

No. 4. WILSON, LOUIS N.
Bibliography of Child Study for the Year 1903. July 1904

No. 5. WILSON, LOUIS N.
Preparing Manuscript for the Press. Jan. 1905

No. 6. Founder's Day, Clark University. Apr. 1905

No. 7. WILSON, LOUIS N.
Bibliography of Child Study for the Year 1904. July 1905

No. 8. DE PEROTT, JOSEPH
The Probable Source of the Plot of Shakespeare's Tempest. Oct. 1905

No. 9. Proceedings and Addresses at the Public Opening of the Art Department of Clark University. Dec. 1905

VOL. 2.

No. 1. List of Books and Pictures in the Clark Memorial Collection. July 1906

No. 2. WILSON, LOUIS N.
Bibliography of Child Study for the Year 1905. Oct. 1906

No. 3. WILSON, LOUIS N.
A few Titles in Child Study. Apr. 1907

No. 4. Proceedings at the First Annual Banquet of the New England Association of Alumni of Clark University, and at the Banquet of the Washington, D. C., Alumni Association, 1907. June 1907

No. 5. WILSON, LOUIS N.
Bibliography of Child Study for the Year 1906. Aug. 1907

No. 6. Wilson, Louis N.
Bibliography of Child Study for the Year 1907.
Sept. 1908

No. 7. Maclaurin, Richard C.
The Outlook for Research (Founder's Day Address, Feb. 1, 1911). Mch. 1911

No. 8. Wilson, Louis N.
List of Papers in the Field of Religious Psychology Presented at Clark University. July 1911

No. 9. Wilson, Louis N.
List of Degrees Granted at Clark University and Clark College.
Oct. 1911

VOL. 3.

No. 1. Roethlein, Barbara Elizabeth
The Relative Legibility of Different Faces of Printing Types.
Jan. 1912

No. 2. Wilson, Louis N.
Suggestions for a Model Private Library at Clark College.
Feb. 1912

No. 3. Burnham, William H.
Bibliographies on Experimental Pedagogy. July, 1912

The department of religious psychology, established within the past few years has grown rapidly and supports The *Journal of Religious Psychology*. The Journal is edited by President Hall and Professor Chamberlain and is now in its sixth volume.

The books in the Art Department are accessible on application to the librarian, but, by the terms of the Founder's will, they cannot be taken from the building.

All the privileges of the library are open to all members of the University, and each member has direct access to every book and journal.

The library is open from 8 a.m. to 6 p.m. each week day from Sept. 1 to July 1. During July and August it is open from 8 a.m. to 5 p.m. from Mondays to Fridays, and on Saturdays from 8 a.m. to 12 m. The library is closed July 4th, Thanksgiving Day and Christmas Day.

Outside the University are found:

The Library of the American Antiquarian Society, organized in 1812, and containing over 120,000 volumes, accessible to all members of the University.

The Worcester Public Library, containing 600 newspapers and magazines and 175,000 volumes, has, in the past, to some extent supplemented the scientific publications purchased by the University, and all its privileges are accessible without charge.

The Library of the Worcester District Medical Society of about 10,000 volumes, is also free to all members of the University.

LIBRARY RULES

No loud talking is allowed in any part of the Library.

Every book shall be returned at the end of one calendar month from the time at which it was taken out, but may be called in at any time at the discretion of the Librarian.

Current numbers of periodicals shall not be taken out until they have been in the Library ten days.

All dictionaries, cyclopædias, and books of general reference are permanently reserved.

Reserved books and current numbers of periodicals, exempt from circulation, may be taken out after 5.30 p.m., but

must be returned before 9 o'clock the next morning, excepting that such books and periodicals may be taken out Saturdays at 12 o'clock m., and may be kept until 9 o'clock the next Monday morning.

Readers must not write nor make any mark upon any book, manuscript, map, or other property belonging to the Library.

Any breach of the above Rules will involve suspension of the Library privileges until personally restored by the Librarian. All such cases shall be laid before the Library Committee at their next meeting.

ART DEPARTMENT

In his last will and testament the Founder of the University bequeathed

"the sum of $100,000, as an endowment fund for the Art Department of said University, and said sum is to be held and kept sacred and intact as a principal not to be used or expended under any conditions; but the income, interest or proceeds thereof shall be used only in putting and keeping said works of art or others given or obtained for said department in good condition and in taking care of them; and then if there is a surplus of the income of said fund left, I will and direct that it be used in the purchase of additional works of art or of such matters as will add to the usefulness and efficiency of said Art Department."

Under these conditions a large room has been furnished and equipped on the upper floor of the Library Building. Upon the death of Mrs. Clark, those of the Founder's collections that were deemed most suitable for this purpose were arranged and displayed in this room, together with

his most valuable books, which, by the conditions of the will, cannot be removed from the building. A complete catalogue of these books and paintings has been published in the PUBLICATIONS OF THE LIBRARY, Vol. 2, No. 1.

A Curator and Custodian have been appointed by the Board (see page 116) and all the collections are now accessible to visitors. The Art Department is open daily (except Sundays) from 9 a.m. to 5 p.m.

In 1909 there was added to the collection a large oil portrait of the late Carroll D. Wright, President of the Collegiate Department from 1902 to 1909. The painting is by the late Frederick P. Vinton of Boston and received the Temple Gold Medal at the 1909 Exhibition of the Pennsylvania Academy of the Fine Arts. In the spring of 1911 a similar portrait of President G. Stanley Hall of the University, also painted by Mr. Vinton, was added, to the collection.

Scale models of the two new buildings and the University grounds have been made by T. J. McAuliffe and Son of Worcester, under the direction of the architects, Messrs. Frost, Briggs and Chamberlain.

REGULATIONS

1. All requisitions for apparatus must be made through the Bursar's office upon printed blanks provided for that purpose and signed by a member of the staff.

2. So far as possible, orders for only the kind and amount of apparatus certain to be used during the year shall be placed; nothing shall be ordered for future years, and apparatus for research shall take precedence over that for teaching and illustration only.

3. Requisitions for repairs, furniture, plumbing and work about the buildings must be made through the Bursar's office in writing and with detail, and, when once passed upon, no change involving additional expense can be made in the requisition without the consent of the Finance Committee.

4. No unappropriated rooms and no part of the University grounds shall be used for any purpose, and appropriated rooms shall not be used for other purposes than the stated University work for which they were intended, without previous permission from the office.

5. Unless for special reasons, absence of instructors from their stated exercises or from town for two consecutive week days in term time should be announced at the office, and for longer absence permission should be obtained beforehand.

6. The Trustees desire that no Instructor, Docent, or

Fellow shall enter upon other engagements outside his proper work in the University of a kind or amount likely to lessen his full efficiency for science within the University.

7. Appropriations shall hereafter cover all apparatus and supplies of whatever nature for laboratories, for demonstration or illustration; all metal and carpenter work connected with the scientific activity of each department; and every form of special service. Appropriations, however, shall not hereafter cover orders for books or journals, which shall be submitted to the Library Committee.

8. The several appropriations made to individual instructors and others shall be the full and fixed limit of the liability of the University, to be on no account transcended; and for every excess over the appropriations, from whatever cause, the instructor making the order shall be personally responsible.

9. No order for any purpose shall be paid by the University, whether on appropriations or for general supplies, that has not passed through the Bursar's office.

10. The President, Professors, Assistant Professors and regular Instructors authorized by the Board to do graduate work, together with the Librarian, shall constitute the Faculty of the University. Its meetings shall be called and presided over by its President, or, in his absence, by a Professor whom he shall designate. The Faculty shall elect a Secretary and its records shall always be accessible to the Trustees. Its jurisdiction shall include all matters pertaining to the instruction, conduct and discipline of students, and such other duties as may be prescribed by the Trustees.

11. The President of the University shall make, at the October meeting, an annual report on the condition of the departments and their work during the year and shall have authority to require and receive from all Instructors and Officers of the University and Library such reports as he may deem necessary. A copy of these reports, including that of the Library, shall be deposited with the Mayor of the City.

12. The University Faculty shall have the oversight of all graduate work and shall recommend for the Master's, Doctor's and all other graduate degrees upon such terms, conditions, and forms as it may determine, and exercise such other functions and responsibilities as are not expressly assigned to the Trustees or to the Collegiate Department.

13. The Custodian of the Art Collection shall have general oversight over its room in the Library Building and its contents, together with their care and use, under the direction and control of the Curator. The Curator shall from time to time submit to the Trustees his recommendations for the purchase of additional works of art from the income of the Art Fund, based on and together with the opinions of experts as to their value and desirability. All such purchases shall be approved by the Board of Trustees, or by such a committee of their members as they shall appoint for that purpose.

14. The President of the University shall make an annual report to the Trustees of the action of the Library Committee, of which he is Chairman, and this report, if approved, shall be filed and preserved.

DEGREES CONFERRED

On June 18, 1912, the University conferred degrees upon the following persons:

MASTER OF ARTS

Ivy Gertrude Campbell
Thesis: A study in pre-Socratic Greek philosophy.

Katherine Ella Dolbear
Thesis: Precocious children.

Dorothy Drake
Thesis: The pedagogy of toys.

Merton Taylor Goodrich
Thesis: On the forms of plane curves of the fourth class.

Merritt Roy Grose
Thesis: A study of the reactions of certain maleinoid and fumaroid compounds with amines.

Samuel Winfield Hirsch
Thesis: The economic, political and social status of the American negro since 1860.

Harry Louis Jackson
Thesis: Housing conditions in Worcester.

Ransom A. Mackie
Thesis: Recent high school reorganization: A study of education during adolescence.

Herman Monroe Potter
Thesis: The influence of water on the velocity of sugar hydrolysis.

Charles Webster St. John
Thesis: The psychology of senescence: An introductory study.

John Frederick William Schulze
Thesis: The fractional distillation of binary mixtures.

William Kendrick Schwab
Thesis: Brazil—the United States of South America.

Rosie Gardner Squier

Thesis: The natural history and daily life of the house fly.

Annie Elizabeth Stoy

Thesis: Suggestion in elementary education.

Robert James Streeter

Thesis: Unemployment: Its causes and proposed remedies.

Robert Morse Woodbury

Thesis: Colora: A study in rural sociology.

Elias Yanovsky

Thesis: Esterification catalysis

DOCTOR OF PHILOSOPHY

Eugene William Bohannon

Dissertation: Exceptional children and the only child in the family.

John Madison Fletcher

Dissertation: An experimental study of some of the in-coördinations of functional speech disturbances.

Frank Eugene Howard

Dissertation: The pedagogy of the emotions.

Karl Johan Karlson

Dissertation: Psychoanalysis and mythology.

John Milton McIndoo

Dissertation: Instinct as related to education.

Tadaichi Ueda

Dissertation: The psychology of justice.

The following gentleman also has taken the examination for the doctor's degree, but has not yet completed all the formal requirements:

A. Caswell Ellis

PUBLICATIONS

A Register and Official Announcement is issued each year in February or March.

In the years 1890, 1891, 1893, and 1902, the annual Report of the President to the Board of Trustees was printed.

A Summer School was held for nine years ending in 1903, and in such years a Summer School Programme was issued.

In July, 1899, the University observed its tenth anniversary, and published the following volume:

Clark University, 1889-1899. Decennial Celebration. 8 x 11 in., pp. 566. Published for the University. Price, $5.00. Contains the lectures delivered by Professors Picard, Boltzmann, Ramon y Cajal, Mosso and Forel at the Decennial Celebration, July, 1899; also reports by the heads of departments on their aims and ideals, with a list of past and present members of the University and the titles of their published papers.

Proceedings of the Child Conference for Research and Welfare. Conferences held at Clark University in the summers of 1909 and 1910. Vol. 1, 1909, 257 p., contains 48 papers on problems relating to child welfare. Vol. 2, 1910, 287 p., contains 34 papers, on similar subjects. The

papers in Vol. 1 were reprinted from the Pedagogical Seminary for September and December 1909, but those in Vol. 2, with one exception, have not been printed elsewhere. Price $2.00 per volume in paper, $2.50 in cloth. Louis N. Wilson, Publisher, Worcester, Mass.

In connection with the celebration of the 20th anniversary of Clark University in September, 1909, conferences and lectures were held in the departments of Psychology and Education to which distinguished scientists and educators in this and other countries contributed. Lectures were given in Pedagogy and Psychiatry by Prof. Sigmund Freud of the University of Vienna and Dr. Carl C. Jung of the University of Zürich; in Psychology by Prof. William Stern of the University of Breslau, by Prof. E. B. Titchener of Cornell University, Prof. Franz Boas of Columbia University, Prof. H. S. Jennings of Johns Hopkins University, and Dr. Adolf Meyer of the Johns Hopkins Medical School; and in School Hygiene by Prof. Leo Burgerstein of the University of Vienna. The conferences in Psychology were presided over by Prof. Guy Montrose Whipple of Cornell University and Prof. Carl E. Seashore of the University of Iowa; and those in Education by Dr. Elmer Ellsworth Brown, U. S. Commissioner of Education, Prof. F. B. Dresslar of the University of Alabama, and Dr. Thomas A. Storey of the College of the City of New York. The lectures in Psychology, Education and School Hygiene and the papers presented at the Educational Conferences have been published in a volume entitled *Lectures and Addresses Delivered Before the Departments of Psychology and Pedagogy in Celebration of the 20th Anniversary of the Opening of Clark University.* Worcester, 1910.

Chemical Addresses: A collection of papers presented at the chemical conferences of the Second Decennial Celebration of Clark University. The collection has been published

jointly by Clark University and the American Chemical Society. In organizing the conferences an effort was made to have all the more important branches of chemical research represented by competent lecturers. The collection includes:

1. Professor Marston Taylor Bogert, of Columbia University: *A Review of Some Recent Investigations in the Quinazoline Group.*

2. Professor John E. Bucher, of Brown University: *The Acids of the Phenyl-Propiolic Series and Their Condensation to Naphthalene Derivatives.*

3. Dr. André Debierne, of the University of Paris, France: *Review of Recent Progress in Radioactive Chemistry.*

4. Dr. C. S. Hudson, of the United States Department of Agriculture: *A Review of Discoveries on the Mutarotation of the Sugars.*

5. Dr. P. A. Levene, of the Rockefeller Institute of Medical Research: *Review of Recent Progress in Bio-Chemistry.*

6. Professor Arthur Michael, sometime Director of the Department of Chemistry in Clark University: *A Theory of Organic Chemistry Founded on the Law of Entropy.*

7. Professor S. P. Mulliken, of the Massachusetts Institute of Technology (formerly of Clark University): *Progress in Systematic Qualitative Organic Analysis.*

8. Professor William A. Noyes, of the University of Illinois: *Molecular Rearrangements of Carbon Compounds.*

9. Professor Theodore William Richards, of Harvard University: *Review of Recent Advances in Thermochemistry.*

10. Mr. Michael D. Sohon, of the Morris High School, New York: *Secondary School Chemistry: Method of Teaching It and Content of the Course.*

11. Professor Julius Stieglitz, of the University of Chicago (formerly of Clark University): *Catalysis, on the Basis of Work with Amido-Esters.*

12. Professor H. P. Talbot, of the Massachusetts Institute of Technology: *Correlation of the Chemical Courses in Secondary Schools and Colleges.*

13. Professor Edward W. Washburn, of the University of Illinois: *The Fundamental Law for a General Theory of Solutions.*

14. Dr. Willis R. Whitney, President of the American Chemical Society, Director of the Research Laboratories of the General Electric Company: *Organization of Industrial Research.*

15. Mr. Jesse E. Whitsit, of the De Witt Clinton High School, New York: *Secondary School Chemistry: Content of the Course.*

The above papers have already been gradually published, partly in *Science*, but mostly in the *Journal of the American Chemical Society.* Further papers, presented at the Clark Celebration by Professor Wilder D. Bancroft, of Cornell University, Professor Gilbert Newton Lewis, of the Massachusetts Institute of Technology, and Professor James F. Norris, of Simmons College, could not be prepared for publication.

China and The Far East, pp. xxii, 455, New York: T. Y. Crowell and Company, 1910, $2.00 net. This volume, edited by George H. Blakeslee, contains, in addition to the historical introduction by the editor, twenty-two of the addresses delivered during the Conference upon China and the Far East, which was held at Clark University, October, 1909, as one part of the Twentieth Anniversary Celebration of that year.

Lectures delivered at the celebration of the Twentieth Anniversary of the foundation of Clark University under the auspices of the Department of Physics.

Vito Volterra, University of Rome: *Sur quelques progrès récents de la physique mathématique.* Three lectures.

Ernest Rutherford, University of Manchester, Nobel laureate: *The History of the Alpha Rays from Radioactive Substances.*

Robert Williams Wood, Johns Hopkins University, Rumford medallist, American Academy of Arts and Sciences: *The Optical Properties of Metallic Vapors.*

Carl Barus, Brown University, Rumford medallist, American Academy of Arts and Sciences: *Certain Physical Properties of the Iron Carbides, together with Inferences Deducible Therefrom.*

Published by Clark University, pp. 161, $2.00.

THE AMERICAN JOURNAL OF PSYCHOLOGY. This journal was commenced in November, 1887, and is now edited by G. Stanley Hall, E. C. Sanford, E. B. Titchener (Cornell University), and J. W. Baird, with the assistance of an international board of co-operators. Each volume contains four numbers—issued in January, April, July and October. Besides original articles, a considerable portion of its space is devoted to careful digests of the important literature in its field. Price $5 per volume; single numbers, $1.50. Florence Chandler, Publisher, Worcester, Mass.

THE PEDAGOGICAL SEMINARY. This journal was begun in January, 1891, and is edited by the President of the University with the assistance of William H. Burnham, Professor of Pedagogy. It is an international record of educational literature, institutions and progress, and is devoted solely to the highest interest of education in all grades, with digests of important literature of all countries. It is the organ of the Educational Department of the University. Each volume contains four numbers—issued in March, June, September and December. Price $5 per volume; single numbers, $1.50. Florence Chandler, Publisher, Worcester, Mass.

JOURNAL OF RELIGIOUS PSYCHOLOGY (including its authropological and sociological aspects). This journal was begun in May, 1904, and is now in its fifth volume. It is edited by President G. Stanley Hall and Professor

Alexander F. Chamberlain. The aim of this journal is to publish original material from all parts of the field of religious psychology. Special attention is devoted to the literature of the subject, both books, monographs and articles in current periodicals. It is published quarterly, each volume (containing about 500 pages) beginning with the January issue. Price $3.00 per volume; single copies $1.00. Louis N. Wilson, Publisher, Worcester, Mass.

The Journal of Race Development. This journal was begun in July, 1910 and is edited by Dr. Blakeslee and President Hall with the coöperation of a board of sixteen contributing editors. It offers itself as a forum for the discussion of the problems which relate to the progress of races and states generally considered backward in their standard of civilization. Issued quarterly, each number containing about 125 pages. Price $2.00 per volume; 50 cts. per number. Louis N. Wilson, Publisher, Worcester, Mass.

UNIVERSITY COLORS

EMERALD GREEN AND WHITE

To be worn in the hood as a green chevron
on a white field

Clark University
in the City of Worcester
Massachusetts

Register and Twenty-sixth Official Announcement

1914

CLARK UNIVERSITY

WORCESTER, MASSACHUSETTS

REGISTER AND TWENTY-SIXTH OFFICIAL ANNOUNCEMENT

WORCESTER, MASSACHUSETTS
Published for the University
February, 1914

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CALENDAR 1914–1915

1914		
FEB. 2	Monday	Founder's Day*
FEB. 23	Monday	Washington's Birthday
APRIL 6	Monday	Spring Recess
APRIL 11	Saturday	
APRIL 20	Monday	Patriots' Day
MAY 30	Saturday	Memorial Day
JUNE 18	Thursday	Twenty-fifth academic year closes

Summer Vacation of 14 Weeks

SEPT. 24	Thursday	Twenty-sixth academic year begins
OCT. 12	Monday	Columbus Day
NOV. 26	Thursday	Thanksgiving Day
DEC. 24	Thursday	Christmas Recess
1915		
JAN. 2	Saturday	
FEB. 1	Monday	Founder's Day*
FEB. 22	Monday	Washington's Birthday
APRIL 5	Monday	Spring Recess
APRIL 10	Saturday	
APRIL 19	Monday	Patriots' Day
MAY 31	Monday	Memorial Day
JUNE 17	Thursday	Twenty-sixth academic year closes

*Not a holiday

MEMBERS

STAFF

GRANVILLE STANLEY HALL, PH.D., LL.D. 156 Woodland St.
President of the University and Professor of Psychology

A.B., Williams College, 1867; A.M., 1870; Ph.D., Harvard University, 1878; Lecturer in Harvard and Williams Colleges, 1880–81; Professor of Psychology, Johns Hopkins University, 1881–88; President and Professor of Psychology, Clark University, 1888–; LL.D., University of Michigan, 1888, Williams College, 1889, and Johns Hopkins University, 1902; Chairman of the Library Committee and Curator of the Art Collection, Clark University. Resident Member of the Massachusetts Historical Society.

WILLIAM EDWARD STORY, PH.D. 17 Hammond St.
Professor of Mathematics and Secretary of the Faculty

A.B., Harvard University, 1871; Ph.D., University of Leipzig, 1875; Parker Fellow (Harvard), 1874–75; Tutor of Mathematics, Harvard University, 1875–76; Associate, Assistant Professor, and Associate Professor of Mathematics, Johns Hopkins University, 1876–89; Professor of Mathematics, Clark University, 1889–; Professor of Mathematics, Clark College, 1902–07. Member of the National Academy of Sciences; Member of the London Mathematical Society; Resident Fellow of the American Academy of Arts and Sciences.

EDMUND CLARK SANFORD, PH.D., SC.D., LL.D.
Lecturer on College Administration 160 Woodland St.

A.B., University of California, 1883; Fellow, Johns Hopkins University, 1887; Ph.D., Johns Hopkins University, 1888; Instructor in Psychology, Johns Hopkins University, 1888; Instructor in Psychology, Clark University, 1889–92; Assistant Professor, 1892–1900; Professor of Psychology, Clark College, 1903–07; Professor of Experimental and Comparative Psychology, Clark University, 1900–09; Lecturer on College Administration, 1909–; Sc.D., Hobart College, 1909; President of Clark College, 1909–; LL.D., University of California, 1912.

ARTHUR GORDON WEBSTER, PH.D., SC.D., LL.D.
Professor of Physics 66 West St.

A.B., Harvard University, 1885; Instructor in Mathematics, Harvard University, 1885–86; Parker Fellow, 1886–89; Student, Universities of Berlin, Paris, Stockholm, 1886–90; Ph.D., University of Berlin, 1890; Docent in Physics, Clark University, 1890–92; Assistant Professor, 1892–1900; Professor, 1900–; Professor of Physics, Clark

College, 1902–07; Director of Physical Laboratories; Sc.D., Tufts College, 1905; LL.D., Hobart College, 1908. Member of the National Academy of Sciences; Resident Fellow of the American Academy of Arts and Sciences; Member of the American Philosophical Society.

HENRY TABER, PH.D.

Professor of Mathematics — 65 West St.

Ph.B., Yale University, 1882; Ph.D., Johns Hopkins University, 1888; Assistant in Mathematics, Johns Hopkins University, 1888–89; Docent in Mathematics, Clark University, 1889–92; Assistant Professor, 1892–1903; Professor, 1903–; Member of the London Mathematical Society; Resident Fellow of the American Academy of Arts and Sciences.

WILLIAM HENRY BURNHAM, PH.D.

Professor of Pedagogy and School Hygiene — 17 Circuit Ave.

A.B., Harvard University, 1882; Instructor in Wittenberg College, 1882–83; Instructor, State Normal School, Potsdam, N. Y., 1883–85; Fellow, Johns Hopkins University, 1885–86; Ph.D., 1888; Instructor in Psychology, 1888–89; Docent in Pedagogy, Clark University, 1890–92; Instructor, 1892–1900; Assistant Professor, 1900–06; Professor, 1906–.

ALEXANDER FRANCIS CHAMBERLAIN, PH.D.

Professor of Anthropology — 19 Baker St.

B.A., University of Toronto, 1886; M.A., 1889; Fellow in Modern Languages, University College, Toronto, 1887–90; Librarian, Canadian Institute, Toronto, 1889–90; Fellow in Anthropology, Clark University, 1890–92; Ph.D., Clark University, 1892; Lecturer in Anthropology, Clark University, 1892–1900; Acting Assistant Professor, 1900–04; Assistant Professor, 1904–11; Professor, 1911–; Editor, *Journal of American Folk-Lore*, 1900–1907; Co-editor, *Journal of Religious Psychology*, 1911–; Corresponding Member O Instituto de Coimbra, Portugal; Member of the American Antiquarian Society; Honorary Member American Folk-Lore Society; Fellow American Ethnological Society; Contributor to *Encyclopedia Britannica* (11th Ed.).

MARTIN ANDRE ROSANOFF, SC.D.

Professor of Chemistry — 11 Downing St.

Ph.B., New York University, 1895; Sc.D., 1908; Student, University of Berlin, 1895–96; University of Paris, 1896–98; Research Fellow, New York University, 1899–1900; Instructor in Theoretical Chemistry, New York University, 1904–05; Assistant Professor of Chemistry, 1905–07; Assistant Professor of Chemistry, Clark University, 1907–11; Professor, 1911–; Assistant Professor of Organic Chemistry, Clark College, 1907–10; Professor, 1910–12; Director of University Chemical Laboratory; Fellow of the American Association for the Advancement of Science; Member of the Royal Society of Arts; Nichols Medalist of the American Chemical Society.

GEORGE HUBBARD BLAKESLEE, PH.D.

Professor of History — 24 Richards St.

A.B., Wesleyan University, 1893; A.M., Harvard University, 1899; Ph.D., 1903; Student, Johns Hopkins University, 1893–94; Parker Fellow, Harvard, 1901–02;

Student, Universities of Berlin, Leipzig, and Oxford, 1901–03; Instructor in History, Clark College, 1903–04; Assistant Professor, 1904–09; Professor, 1909–; Instructor in History, Clark University, 1905–11; Professor, 1911–.

JOHN WALLACE BAIRD, PH.D. — 17 Circuit Ave.

Professor of Experimental Psychology

A.B., University of Toronto, 1897; Student, University of Leipzig, 1898–99; Fellow, University of Wisconsin, 1899–1901; Fellow, Cornell University, 1901–02; Ph.D., 1902; Assistant in Psychology, 1902–03; Carnegie Research Assistant, 1903–04; Instructor in Psychology, Johns Hopkins University, 1904–06; Instructor in Psychology, University of Illinois, 1906–07; Assistant Professor, 1907–February, 1910; Assistant Professor of Experimental Psychology, Clark University, February, 1910–February, 1913; Professor, February, 1913–.

RALPH STAYNER LILLIE, PH.D

Professor of Biology — 21 Dayton St.

A.B., University of Toronto, 1896; Student, University of Michigan, 1896–97; Fellow, University of Chicago, 1898–1901; Ph.D., 1901; Assistant in Physiology, Harvard University, 1901–02; Instructor, University of Nebraska, 1902–03; Adjunct Professor, 1903–04; Carnegie Research Assistant at Zoölogical Station, Naples, 1904–05; Instructor in Physiology, Harvard University, 1905–06; Johnston Scholar, Johns Hopkins University, 1906–07; Instructor in Physiological Zoölogy, University of Pennsylvania, 1907–12; Assistant Professor of Experimental Zoölogy, 1912–13; Instructor in General and Comparative Physiology, Marine Biological Laboratory, Woods Hole, Mass., 1902–; Professor of Biology, Clark University, October 1913–.

JOSEPH DE PEROTT

Lecturer in Mathematics — 5 Hawthorn St.

Student, Universities of Paris and Berlin, 1877–80; Docent in Mathematics, Clark University, 1890–1904; Lecturer, 1904–.

LOUIS N. WILSON, LITT.D. — 11 Shirley St.

Librarian of the University and Custodian of the Art Collection

Litt.D., Tufts College, 1905.

FRANK HAMILTON HANKINS, PH.D.

Instructor in Economics and Sociology — 4 Cabot St.

A.B., Baker University, 1901; Student, Columbia University, 1903–04; Scholar in Sociology, 1904–05; Fellow in Statistics, 1905–06; Student, 1907–08; Ph.D., Columbia University, 1908; Instructor in Economics, Clark College, 1906–07; Assistant Professor, 1908–13; Professor of Political and Social Science, 1913–; Instructor in Economics and Sociology, Clark University, 1906–07; 1908–.

JOHN CHARLES HUBBARD, PH.D.

Instructor in Physics — 8 Loudon St.

B. S., University of Colorado, 1901; Scholar in Physics, Clark University, and Assistant to Professor Webster, 1901–02; Fellow, 1902–04; Ph. D., Clark University,

1904; Instructor in Physics, Simmons College, 1904-05; Asssistant Professor of Physics, New York University, 1905–06; Assistant Professor of Physics, Clark College, 1906–11; Professor, 1911–; Honorary Fellow in Physics, Clark University, 1907–09; Instructor, 1910–.

FRANK BLAIR WILLIAMS, PH.D.
Instructor in Mathematics — 2 Isabella St.

C.E., University of Missouri, 1890; M. S., 1893; Engineering Work with the Mississippi River Commission, 1890–92; Teaching Fellow in Mathematics, University of Missouri, 1892–93; Survey Work with the Mississipi River Commission, 1894–95; United States Assistant Engineer in Tennessee River Improvement, 1895–97; Scholar in Mathematics, Clark University, 1897–98; Fellow, 1898–1900; Ph.D., 1900; Assistant Professor of Civil Engineering, Union College, 1900–05; Assistant Professor of Engineering and Mathematics, 1905–06; Professor of Engineering Mathematics, 1906–07; Assistant Professor of Mathematics, Clark College, 1907–08; Professor, 1908–; Honorary Fellow in Mathematics, Clark University, 1909–10; Instructor, 1910–.

ANNUAL APPOINTMENTS

EDWARD COWLES, M.D., LL.D., Boston
Non-Resident Lecturer in Psychiatry

A.B., Dartmouth College, 1859; A.M., 1863; Medical House Pupil, Retreat for the Insane, Hartford, Conn., 1860–62; M.D., Dartmouth Medical School, 1863; M.D., College of Physicians and Surgeons, New York, 1863; Medical Corps, United States Army, 1863–72; Resident Physician and Superintendent, Boston City Hospital, 1872–79; Medical Superintendent, McLean Hospital, Waverley, Mass., 1879–1903; Lecturer on Mental Diseases, Dartmouth Medical School, 1885–86; Professor of Mental Diseases, 1886–; Fellow by Courtesy, Johns Hopkins University, 1887-88; Clinical Instructor in Mental Diseases, Harvard Medical School, 1888–; LL.D., Dartmouth College, 1890; Non-Resident Lecturer in Psychiatry, Clark University, 1903–.

ARTHUR AMOS NOYES, PH.D., SC.D., LL.D., Boston
Non-Resident Lecturer in Chemical Research

S.B., Massachusetts Institute of Technology, 1886; S.M., 1887; Ph.D., University of Leipzig, 1890; Assistant and Instructor in Chemistry, Massachusetts Institute of Technology, 1887–88 and 1890–94; Assistant Professor, 1894–99; Professor and Director of the Research Laboratory of Physical Chemistry, 1899–; Non-Resident Lecturer in Chemical Research, Clark University, 1910–. Member of the National Academy of Sciences.

ROBERT KENNEDY DUNCAN, A.B., Pittsburgh, Pennsylvania
Non-Resident Lecturer in Industrial Chemical Research

A.B., University of Toronto, 1892; Fellow in Chemistry, Clark University, 1892–93; Graduate Student, Columbia University, 1897–98; Professor of Chemistry,

Washington and Jefferson College, 1901–06; Professor of Industrial Chemistry, University of Kansas, 1906–; Director of Industrial Research, 1910–; Professor of Industrial Chemistry and Director of Industrial Research, University of Pittsburgh, 1910–; Non-Resident Lecturer in Industrial Chemical Research, Clark University, 1911–.

JAMES FLACK NORRIS, PH.D., Boston
Non-Resident Lecturer in Organic Chemistry

A.B., Johns Hopkins University, 1892; Scholar in Chemistry, 1892–93; Fellow 1894–95; Ph.D., 1895; Instructor in Organic Chemistry, Massachusetts Institute of Technology, 1895–1900; Assistant Professor, 1900–04; Professor of Chemistry, Simmons College, 1904–; Lecturer in Organic Chemistry, Harvard University, 1912–. Fellow of the American Academy of Arts and Sciences.

SAMUEL PAUL CAPEN, PH.D.
Lecturer on School Administration — 21 Downing St.

A.B., A.M., Tufts College, 1898; A.M., Harvard University, 1900; Ph.D., University of Pennsylvania, 1902; Harrison Fellow in Germanic Languages, University of Pennsylvania, 1900–01; Graduate Student, on leave of absence, 1901–02; Student, University of Leipzig, 1901–02; Instructor in Modern Languages, Clark College, 1902–03; Assistant Professor, 1903–08; Professor, 1908–February, 1914; Lecturer on School Administration, Clark University, 1911–; Specialist in Higher Education-U. S. Bureau of Education, Washington, D. C., February, 1914–.

SAMUEL WEILLER FERNBERGER, PH.D.
Instructor in Experimental Psychology — 767 Main St.

B. S., University of Pennsylvania, 1908; M.A., 1909; Ph.D., 1912; Assistant in Psychology, University of Pennsylvania, 1908–09; Instructor, 1910–12; Instructor in Experimental Psychology, Clark University, 1912–.

NORMAN SCOTT BRIEN GRAS, PH.D. — 23 Maywood St.
Lecturer in History

A.B., Western University, 1906, A.M. 1906; A.M., Harvard University, 1909; Ph.D., 1912; University Scholar, Harvard University, 1907–08; Goodwin Fellow, 1908–09; Kirkland and Sheldon Traveling Fellow (Europe), 1910–12; Instructor in Economics, Western University, 1905–06; Assistant in History, Harvard University, 1909–10; Assistant Professor of History, Clark College, 1912–.

THEODATE L. SMITH, PH.D. — 23 Maywood St.
Lecturer and Librarian in the Children's Institute

A.B., Smith College, 1882; A.M., 1884; Student, Yale University, 1893–95; Special Student, Clark University, 1895–96; Ph.D., Yale University. 1896; Cornell University, 1900; Assistant to President Hall in research work under Carnegie grant, Clark University, 1902–04; Estabrook grant, October, 1904–February, 1905; Berlin University,

April–August, 1905; Research Assistant to President Hall, Clark University, 1905–09; Lecturer and Librarian in the Children's Institute, 1909–.

AMY ELIZA TANNER, PH.D., Faribault, Minnesota
Research Assistant to President Hall — 48 Downing St.

A.B., University of Michigan, 1893; Scholar, University of Chicago, 1894–95; Fellow, 1895–98; Ph.D., University of Chicago, 1898; Associate in Philosophy, 1898–1902; Professor of Philosophy, Wilson College, 1903–07; Honorary Fellow in Psychology, Clark University, 1907–09; Lecturer in the Children's Institute, 1909-11; Research Assistant to President Hall, 1911–.

RADOSLAV ANDREA TSANOFF, PH.D.
Instructor in Philosophy — 109 Lovell St.

A.B., Oberlin College, 1906; Scholar in Philosophy, Cornell University, 1907–08; Susan Linn Sage Fellow, 1908–10; Ph.D., 1910; engaged in research at Columbia University, 1910–12; Instructor in Philosophy, Clark University, 1912–; Instructor in Philosophy, Clark College, 1912–.

GEORGE FREDERIC WHITE, PH.D.
Docent in Biological Chemistry — 941 Main St.

S.B., Massachusetts Institute of Technology, 1906; Ph.D., Johns Hopkins University, 1910; Assistant in Analytical and Organic Chemistry, Massachusetts Institute of Technology, 1906–08; Fellow, Johns Hopkins University, 1909–10; Associate Professor of Chemistry, Richmond College, 1910–12; Chief Chemist, Woods Hole Laboratories of the United States Bureau of Fisheries, 1911–12; Instructor in Organic Chemistry, Clark College, 1912–13; Assistant Professor, 1913–.

HONORARY FELLOWS

ARTHUR KENNEDY BEIK, PH.D., Wapello, Iowa
Honorary Fellow in Pedagogy and Assistant in the Educational Museum — 10 Gates St.

Ph.B., Grinnell College, 1908; Ped. M., School of Pedagogy, New York University, 1909; Fellow in Pedagogy, Clark University, 1911–13; Ph.D., 1913.

JAMES ATKINS BULLARD, A.B.
Honorary Fellow in Mathematics — 18 Walnut St.

A.B., Williams College, 1908; Instructor in Mathematics, Worcester Polytechnic Institute, 1908–; Student in Mathematics, Clark University, 1908–11; Honorary Fellow, 1911–.

ARTHUR DEXTER BUTTERFIELD, A.M.
Honorary Fellow in Mathematics — 10 Schussler Road

B.S., Worcester Polytechnic Institute, 1893; M.S., 1898; A.M., Columbia University,

1904; Instructor in Civil Engineering, Worcester Polytechnic Institute, 1894–98; Instructor in Mathematics, Engineering Department, University of Vermont, 1898–1900; Assistant Professor, 1900–04; Professor of Mathematics and Mechanics, 1904–08; Assistant Professor of Mathematics, Worcester Polytechnic Institute, 1908–10; Professor, 1910–; Student in Physics and Mathematics, Clark University, 1908–09; Honorary Fellow in Mathematics, 1909–.

U. Waldo Cuttler, B.S.

Honorary Fellow in Psychology and Lecturer in the Children's Institute — 63 Lancaster St.

B.S., Worcester Polytechnic Institute, 1874; Student at Leipzig, Gottingen and Geneva Universities, 1879–81; Instructor in Modern Languages, Worcester Polytechnic Institute, 1881–92; Professor, 1892–1903; Student, Johns Hopkins University, 1889; Honorary Fellow in Psychology, Clark University, 1905–07.

Donald Walton Davis, Ph.D.

Honorary Fellow in Biology — 101 Lovell St.

A.B., Harvard University, 1905; Assistant in Zoölogy, 1903–04; Assistant in Zoölogy Radcliffe College, 1904–05; Assistant in Zoölogy, University of California, 1905–06; Professor of Biology, Sweet Briar College, 1907–09; Graduate Student, Harvard University, 1909–12; Instructor in Zoölogy, Radcliffe College, 1909–12; Assistant in Histology, Harvard University, 1911–12; Assistant Professor of Zoölogy, Clark College, 1912–; Ph.D., Harvard University, 1913.

Irving Angell Field, Ph.D., Auburn

Honorary Fellow in Biology

B.S., Denison University, 1903; Instructor in Ornithology, 1902–03; Assistant in Zoölogy, Harvard University, 1903–05; Austin Teaching Fellow, 1905–06; Professor of Chemistry and Biology, Western Maryland College, 1906–11; A.M., Harvard University, 1912; Instructor in Biology, Clark College, 1911–; Honorary Fellow in Biology, Clark University, 1911–; Ph.D., 1913.

Sara Carolyn Fisher, Ph.D. Chicago, Illinois

Honorary Fellow in Psychology — 11 Richards St.

A.B., Lombard College, 1909; A.M., University of Illinois, 1910; Fellow in Psychology, Clark University, 1910–13; Ph.D., 1913; Instructor in Psychology, Wellesley College, 1913–.

James Edmund Ives, Ph.D.

Honorary Fellow in Physics — 1030 Main St.

Assistant Curator, Academy of Natural Sciences, Philadelphia, 1887–93; Instructor in Physics, Drexel Institute, 1893–97; Jessup Student, Academy of Natural Sciences, Philadelphia, 1887–91; Student in Histology and Embryology, University of Pennsylvania, 1888–89; Student in Mathematics, 1893–95; Student in Physics, Cavendish Laboratory, Cambridge, England, 1896; Scholar in Physics, Clark University, 1897–98; Fellow, 1898–1901; Ph.D., 1901; Instructor in Physics, University of Cincinnati, 1901–03; Assistant Professor, 1905–10; Associate Professor, 1910–12; Honorary Fellow in Physics, Clark University, 1912–.

KARL JOHAN KARLSON, PH.D., Myresjo, Sweden
Honorary Fellow in Psychology 6 Wyman St.

A.B., Clark College, 1909; Scholar in Psychology, Clark University, 1909–10; A.M., 1910; Fellow, 1910–12; Ph.D., 1912; Honorary Fellow in Psychology, Clark University, 1912–.

CAREY EYSTER MELVILLE, A.B.
Honorary Fellow in Mathematics 3 Ferdinand St.

A.B., Northwestern University, 1901; Fellow in Mathematics, 1901–02; Graduate Student in Mathematics, Johns Hopkins University, 1902–03; Instructor in Mathematics, Case School of Applied Science, 1903–06; Honorary Fellow in Mathematics, Clark University, 1906–; Assistant in Mathematics, Clark College, 1906–09; Instructor, 1909–10; Instructor in Mathematics and Physics, 1910–11; Assistant Professor, 1911–.

FRANK K. SECHRIST, PH.D.
Honorary Fellow in Psychology and Lecturer in the Children's Institute 7 Horner St.

Ph.B., Lafayette College, 1892; Professor of English, State Normal School, Lock Haven, Pa., 1892–99; Graduate Student, Lafayette College, 1893–98; Ph.D., 1898; Professor of Psychology and Pedagogy, State Normal School, Lock Haven, Pa., 1899–1900; Professor of English, State Normal School, Stevens Point, Wis., 1900–10; University of Jena, 1907; Head of Department of English and Modern Languages, and Professor of Psychology and Education, Rhode Island State College, 1910–12; Graduate Student, Harvard University, 1911; Honorary Fellow in Psychology, Clark University, 1912–; Ph. D., 1913.

FELLOWS

WALTER JOSEPH BANKES, Cardington, Ohio
Fellow in Pedagogy 101 May St.

Student, Ohio University, 1904–06; Lima College, 1906–08.

CHARLES LEWIS BRIGHTMAN, A.M.
Fellow in Physics 6 Downing St.

Ph B., Brown University, 1909; A.M., 1909; Assistant in Physics, Wesleyan University, 1909–10; Instructor in Physics, Mount Holyoke College. 1910–13.

IVY GERTRUDE CAMPBELL, A.M., Malvern, Iowa
Fellow in Psychology 23 Kingsbury St.

A.B., University of Colorado, 1911; Scholar in Psychology, Clark University, 1911–12; A.M., 1912; Fellow in Psychology, 1912–.

HAROLD RANDOLPH CROSLAND, A.B., Orangeburg, South Carolina
Fellow in Psychology 815 Main St.

A.B., University of South Carolina, 1913.

WILLIAM LEARNED DEALEY, A.M., Providence, Rhode Island
Fellow in Psychology — 28 Hollywood St.

A.B., Brown University, 1913; A.M., 1913; Fellow in Psychology, Clark University, February 1913–.

RAYMOND AUGUSTINE DUNPHY, A.M., North Brookfield
Fellow in Chemistry — 18 Hammond St.

A.B., Clark College, 1912; Scholar in Chemistry, Clark University, 1912–13; A.M., 1913.

OSCAR LEE DUSTHEIMER, B.S., Thornville, Ohio
Fellow in Mathematics — 78 Florence St.

B.S., Ohio University, 1913.

ROBERT SIDNEY ELLIS, A.B., Germantown, Tennessee
Fellow in Psychology — 28 Hollywood St.

A.B., University of Arkansas, 1911; Scholar in Psychology, University of Chicago, 1912; Fellow in Pedagogy, New York University, 1912–13.

ARTHUR EDWARD HAMILTON, A.M., Mexico City, Mexico
Fellow in Psychology — 8 Silver St.

Student in Psychology, Clark University, 1911–12; Fellow, 1912–January, 1914; A.M., 1913; Lecturer and in charge of Extension Department of Eugenics Record Office, Cold Spring Harbor, New York, January, 1914–.

ERNEST HAMMOND, A.M., Milan, Ohio
Fellow in Pedagogy — 5 Clifton St.

Pd.B., Ohio University, 1910; Scholar in Pedagogy, Clark University, 1910–11; A.M., 1911; Fellow, 1911.

MARION MYRL HARRISON, A.M., Owensboro, Kentucky
Fellow in Chemistry — 126 Woodland St.

B.S., Kentucky State University, 1912; Fellow in Chemistry, Clark University, 1912–; A.M., 1913.

BAITEN HORI, Tokyo, Japan
Fellow in Psychology — 91 Lovell St.

Graduate, Keiogijuku University, Tokyo, Japan, 1911; Scholar in Psychology, Clark University, 1912–13.

GEORGE ELLIS JONES, A.M., Centerville, Iowa
Fellow in Pedagogy — 145 Woodland St.

A.B., Kansas State Normal School, 1909; Scholar in Pedagogy, Clark University, 1912–13; A.M., 1913.

Samuel Calmin Kohs, B.S., New York City
Fellow in Psychology and Assistant in the Children's Institute
26 Hollywood St.

Student, Columbia University, 1911; B.S , College of the City of New York 1912; Research Assistant in Psychological Laboratory of the Vineland Training School, 1912–13.

Yoshihide Kubo, Tokyo, Japan
Fellow in Psychology 3 Ferdinand St.

Graduate, Imperial University, Tokyo, Japan, 1909; Student in University Hall, Tokyo, Japan, 1910–12.

Peysah Leyzerah
Fellow in Mathematics 71 Penn Ave.

Graduate, Dinaburg Real Gymnasium, 1911; Student in Mathematics, Clark University, 1912–13.

Sidney Liebovitz, A.M., New York City
Fellow in Chemistry 78 Birch St.

A.B., Columbia University, 1909; A.M., 1912.

Cecil Kenyon Lyans, A.B., Eugene, Oregon
Fellow in Pedagogy 37 Clifton St.

A.B., University of Oregon, 1909; B.A., Oxford University, England, 1913.

Clarence McCormick, A.B., Arkansas City, Kansas
Fellow in Mathematics 17 Charlotte St.

A.B., University of Kansas, 1913.

Ernest Clifton McDougle, A.M., Richmond, Kentucky
Fellow in Pedagogy 15 Shirley St.

B.S., National Normal University, Lebanon, Ohio, 1891; C.E., 1891; A.B., Southern Normal University, Huntingdon, Tenn., 1893; Professor of Science, 1894–96; A.M., 1895; Professor of Belles Lettres, National Normal University, 1896–1901; President Southern Normal University, 1901–02; Georgie Robertson Christian College, 1902–07; Professor of Pedagogy, State Normal School, Richmond, Ky., 1907–.

Floyd Marion McDowell, A.B., Lamoni, Iowa
Fellow in Psychology 48 Florence St.

A.B., University of Iowa, 1911; Professor of Education and Psychology, Graceland College, 1911–13.

Arthur Monroe, A.M., Spencer
Fellow in History

A.B., Amherst College, 1897; Student, Harvard Law School, 1897–99; Student in History, Clark University, 1910–11; A.M., 1911; Scholar, 1911–13.

HAROLD ARTHUR MORTON, A.M.
Fellow in Chemistry 8 Pelham St.

A.B., Clark College, 1912; Scholar in Chemistry, Clark University, 1912–13; A.M. 1913.

FRANCIS JOHN O'BRIEN, A.M.
Fellow in Psychology 69 East Central St.

A.B., Holy Cross College, 1912; Scholar in Psychology. Clark University, 1912–13; A.M., 1913.

WILLIAM BRYANT PERRY, A.M.
Fellow in Psychology 13 Parker St.

B.D., Bishop Payne Divinity School, Va., 1898; A.B., Lotta University, N. C., 1908; Student in Psychology, Clark University, 1910–11; A.M., 1911; Scholar, 1911–12; Fellow, 1912–.

DONALD IRVING POPE, A.B., Red Cloud, Nebraska
Fellow in Psychology 13 Gates St.

A.B., University of Nebraska, 1898; Fellow in Sociology, University of Chicago, 1910–11; Fellow in Psychology, Clark University, 1912–.

WALLACE FRANK POWERS, A.M., Spencer
Fellow in Physics 67 Charlotte St.

A.B., Clark College, 1910; Assistant in Physics, 1910–13; Scholar in Physics, Clark University, 1910–11; A M., 1911; Fellow, 1911–.

LILLIAN ROSANOFF, A.M., New York City
Fellow in Chemistry 11 Downing St.

A.B., Barnard College, 1908; A.M., Columbia University, 1911; Fellow in Chemistry, Clark University, 1912–.

PAUL ROWLAND, A.M., Sapporo, Japan
Fellow in Psychology 28 Hollywood St.

A.B., Williams College, 1909; A.M., Harvard University, 1912.

JOHN FREDERIC WILLIAM SCHULZE, A.M., New York City
Fellow in Chemistry and Research Assistant to Dr. Rosanoff
7 West Oberlin St.

B.S., New York University, 1911; Ch. E., 1913; W.H. Inman Fellow, New York University, 1911–12; Fellow in Chemistry and Research Assistant to Dr. Rosanoff Clark University, 1911–; A.M., 1912.

GEORGE SAMUEL SNODDY, A.M., Emporia, Kansas
Fellow in Psychology 815 Main St.

A.B., University of Kansas, 1912; B.S., 1912; A.M., 1913; Assistant Instructor in Educational Psychology, 1912–13.

HAROLD FREDERIC STIMSON, A.M., Rochdale
Fellow in Physics and Research Assistant to Dr. Webster
8 Loudon St.

A.B., Clark College, 1910; Scholar in Physics, Clark University, 1910–11; A.M., 1911; Fellow in Physics and Research Assistant to Dr. Webster, 1911–.

RAYMOND HOLDER WHEELER, A.M., Berlin
Fellow in Psychology and Research Assistant to Dr. Baird
65 Downing St.

A.B., Clark College, 1912; Assistant in Psychology, 1912–13; Scholar in Psychology, Clark University, 1912–13; A.M., 1913.

EDWARD CLINTON WILSON, A.B., Knoxville, Tennessee
Fellow in Psychology 47 May St.

A.B., Milligan College, 1887; Student in Psychology, Clark University, November 11–December 18, 1912.

SCHOLARS

LAWRENCE AUGUSTUS AVERILL, A.B., Wiscasset, Maine
Scholar in Pedagogy 29 Abbott St.

A.B., Clark College, 1913; Assistant in German, 1912–13; Instructor, 1913–.

FRANCIS CORLISS BERRY, A.B.
Scholar in Pedagogy 24 Jefferson St.

A.B., Holy Cross College, 1913.

SETRAK KRIKOR BOYAJIAN, Madison, Wisconsin
Scholar in History 70 Woodland St.

Student, Euphrates College, 1903–06; University of Wisconsin, 1910–13.

THOMAS ISAACS BROWN, A.B., Port Antonio, Jamaica
Scholar in Economics 21 Bancroft St.

A.B., Clark College, 1913.

WALTER GUY BUTLER, A.B.
Scholar in Economics 29 Maywood St.

A.B., Clark College, 1912; Assistant in Economics, 1912–; Scholar in Economics, Clark University, 1912–.

EDWARD MARION AUGUSTUS CHANDLER, A.B., Jacksonville, Florida
Scholar in Chemistry — 21 Bancroft St.

A.B., Howard University, 1913.

GEORGE ALLEN COE, B.H., Springfield
Scholar in Pedagogy — 2 Ripley Place

B.H., International Y. M. C. A. College, Springfield, Mass., 1909; Instructor in English, 1908–09.

HERBERT KIMBALL CUMMINGS, B.S., West Boylston
Scholar in Physics

B.S., Worcester Polytechnic Institute, 1910; Instructor in Physics and Chemistry, Alfred University, 1910–11; Instructor in Physics, Worcester Polytechnic Institute, 1911–; Student in Physics, Clark University, 1911–13.

LEO HENRY DAWSON, A.B., Medfield
Scholar in Chemistry — 77 Downing St.

A.B., Clark College, 1912.

ALLAN DICKIE, A.B.
Scholar in History — 6 Shirley St.

A.B., Clark College, 1912.

CHARLES ANTHONY DONLON, A.B., Fitchburg
Scholar in Pedagogy — 82 Woodland St.

A.B., Holy Cross College, 1913.

HAROLD LUTHER FENNER, A.B.
Scholar in History — 31 Dayton St.

A.B., Clark College, 1910.

MAE HUBBARD, A.B., Boulder, Colorado
Scholar in Anthropology — 8 Loudon St.

A.B., University of Colorado, 1913.

CHIMAKI KAGEYAMA, Suruga, Japan
Scholar in Psychology — 105 Fairfield St.

Graduate, Waseda University, Tokyo, Japan, 1905; Student, Ohio State University, 1907–08; Special Student, Boston University, 1908–10.

JOSEPH KHOTIMLANSKY, St. Petersburg, Russia
Scholar in Chemistry — 1 Maywood Place

Graduate, St. Petersburg Gymnasium, 1907; Scholar in Chemistry, Clark University, 1912–.

MERLE COE KNAPP, B.P.E., Kansas City, Missouri
Scholar in Pedagogy — 938 Main St.

B. P. E., International Y. M. C. A. College, Springfield, Mass., 1913.

CHARLES BERNARD LEWIS, M.D.
Scholar in Pedagogy — 6 Loudon St.

M.D., Tufts Medical College, 1909; Physical Director, Allegheny College, 1902–05; Tufts College, 1905–09.

FLORENCE MATEER, Paoli, Pennsylvania
Scholar in Psychology — 23 Maywood St.

Graduate, State Normal School, West Chester, Pa., 1906; Student, University of Pennsylvania, 1912–13; Research Assistant in Psychological Laboratory of the Vineland Training School, 1911–13.

JOHN FRANCIS O'CONNELL, A.B.
Scholar in Pedagogy — 564 Millbury St.

A.B., Holy Cross College, 1913.

JOSEPH VINCENT O'CONNELL, A.B.
Scholar in Pedagogy — 10 Middle River Road

A.B., Holy Cross College, 1913.

EFFIE DOANE PETTIT, A.M., Waldo, Florida
Scholar in Pedagogy — 7 Hancock St.

A.B., Florida State College for Women, 1909; A.M., 1912.

GAULT W. PLEASANT, A.B., Ballantine, Montana
Scholar in Psychology — 30 Maywood St.

A.B., Union Christian College, 1913; Instructor in History and Civics, 1911–13.

JOHN HENRY PURNELL, A.B., Trappe, Maryland
Scholar in Pedagogy — 21 Bancroft St.

A.B., Howard University, 1913.

ALLAN GALE RICE, A.M.
Scholar in History — 862 Main St.

A.B., Clark College, 1910; Scholar in History, Clark University, 1910–; A.M., 1913.

ANCEL ST. JOHN, PH.B.
Scholar in Physics — 53 Queen St.

Ph.B., University of Rochester, 1906; Instructor in Physics, Syrian Protestant College, Beirut, Syria, 1906–09; Assistant in Physics, Columbia University, 1909–10; Acting Professor of Physics, Emory and Henry College, 1910–12; Instructor in Physics, Worcester Polytechnic Institute, 1912–; Student in Physics, Clark University, 1912–13.

Clarence Prouty Shedd, A.B.
Scholar in History — 4 Reidl Place

A.B., Clark College, 1909; Scholar in History, Clark University, 1911–.

William Roderick Sherman, A.B., Newport, Rhode Island
Scholar in History — 21 King St.

A.B., Clark College, 1913; Assistant in History, 1913–.

Curtis T. Williams, A.B., Emporia, Kansas
Scholar in Psychology — 315 Lovell St.

A.B., Kansas Teachers College, 1913.

Samuel Zeldin,
Scholar in Mathematics — 95 Millbury St.

Graduate, Real Gymnasia, Orsha, Russia, 1913.

Other Students

James Mace Andress, A.M.
Student in Psychology — 37 Circuit Ave.

B.Pd., Michigan State Normal College, 1905; A.B., 1905; Graduate Student, University of Chicago, 1905–06; Ph.M., 1906; Instructor in History and Education, Manchester College, 1905–07; Scholar in Education, Harvard University, 1907–08; A.M., 1908; Instructor in Educational Psychology, History of Education, Hygiene, State Normal School, Worcester, Mass., 1908–.

Peter William Brouwers, B.S., Whitinsville
Student in Mathematics — 7 Dayton St.

B.S., Worcester Polytechnic Institute, 1913; Instructor in Mathematics, 1913–.

Earl Van Dusen Burdick, A.B., Hamilton, New York
Student in Pedagogy — 3 Dix St.

A.B., Colgate University, 1911; Instructor in French and German, Worcester Polytechnic Institute, 1911–; Student in Psychology, Clark University, 1911–13.

Bertha Caroline Downing, M.D.
Student in Biology — 4 Downing St.

Harvard Annex, 1887; M.D., Woman's Medical College of Pennsylvania, 1896; Honorary Fellow in Psychology and Biology, Clark University, 1905–06; Honorary Fellow in Psychology, 1906–07; Student, 1909–10; A.M., 1910; Member American Association for the Study of the Feeble-Minded; Fellow of American Academy of Medicine.

Francis Lee Dunham, M.D., Leominster
Student in Psychology

A.B., University of Vermont, 1894; M.D., 1897; Graduate Student, Columbia University, 1897–98; Student in Psychology, Clark University, March, 1913–.

William Henry Hayes, A.B., Oxford
Student in Psychology

A.B., Wesleyan University, 1895; Student, Yale Divinity School, 1898–1901; Student in Psychology, Clark University, 1912–.

George Winfield Morris, A.B., Marlboro
Student in History

A.B., Brown University, 1898; Student in History, Clark University, 1912–.

Mary Elizabeth Morse, M.D.
Student in Psychology 338 Plantation St.

A.B., Goucher College, 1899; M.D., Johns Hopkins University, 1903; Assistant Pathologist, Worcester State Hospital, January, 1913–.

Caroline Amelia Osborne, Ph.D.
Student in Psychiatry 145 Woodland St.

M.D., Woman's Medical College of Pennsylvania, 1899; Superintendent of Nurses, Memorial Hospital, Worcester, Mass., 1899–1904; Instructor of Nurses, 1904–; Student in Biology, Clark University, 1901–05; Fellow, 1905–06; Honorary Fellow, 1906–10; A.M., Clark University, 1907; Ph.D., 1908; Student in Psychiatry, 1911–12.

Emelyn Newcomb Partridge
Student in Anthropology 54 Hollywood St.

Charles Moen Rice, A.B.
Student in Mathematics 9 Bowdoin St.

A.B., Harvard University, 1882; Student in Mathematics, Clark University, 1909–.

Attendants upon Saturday Courses

Frank A. Andrews, Worcester
Frank E. Jones, Worcester
Lucy A. Osborne, Worcester
Bessie S. Pierce, Worcester
Emerson B. Savery, Putnam, Conn.

Attendants upon Children's Institute Lectures

Edith Billings
Emma L. Brennan
Nellie G. Carey
Edith M. Dixon
Maud A. Dodge
John J. Donoghue
Agnes L. Drugan
Sarah C. Ebersole
Charlotte Emerson
Robert J. Flody

E. A. Flynn
Clara M. Gove
Mrs. Henry J. Gross
Catharine D. Higgins
Ethel L. Howard
Lucia L. Jaquith
Cecilia T. Kelley
Grace M. Kennedy
Georgia A. King
Margaret V. Kirby
Eleanor E. McDermott
Annie V. McGourty
Daniel J. Marshall
Mary E. Murphy
Arthur C. Nutt
Grace E. Oliver
Michael J. O'Meara
Mrs. Lewis E. Pierce
Josie F. Riordan
Lucia A. G. Sawin
Ethel M. Shepard
Margaret A. Tracy

Undergraduates Attending One or More University courses

Hugo P. Karlson
Eugene W. Roark
Adrian Thomas
Thomas G. Thompson
John Thomas Ward

Florence Chandler — 938 Main St.
Bursar, and Clerk of the University

Elizabeth Anna Felt — 19 Bowdoin St.
Assistant in the Bursar's office

Mary Evelyn Fitzsimmons, S.B. — 48 Downing St.
Private Secretary to the President

Instructors	27
Fellows, Scholars and Students	85
Saturday Courses	5
Children's Institute Lectures	32
Undergraduates	5
Total	154

ADMINISTRATION

The trustees are the ultimate source of authority in all matters pertaining to the University. They act collectively, through committees, and also through the President of the University.

Duties of the President of the University

The duties of this office were defined by the Trustees, May 23, 1889, as follows:

The President of the University shall consult frequently with the Trustees on all matters that concern the welfare of the University, and attend the meetings of the Board. He shall confer with each instructor concerning the development of his department, determine the duties and authority of each, and preside at the meetings of the Faculty. He shall be the authorized medium of communication between the Board of Trustees and the officers of instruction, individually and collectively, in all matters involving the administration of the University. The enactments of the Board concerning instructors and their work, and all requests, complaints and proposals from the Faculty to the Trustees shall be made known through him. He shall exercise or provide such superintendence over buildings, apparatus, books and other property, as will secure their protection and appropriate use. Expenditures must not be ordered by any instructor of the University without his previous consent or the express authority of the Board.

These duties were more fully defined by By-Laws enacted by the Corporation, Sept. 26, 1889. These are as follows:

BY-LAWS

1. The President of the University shall preside on all public academic occasions, shall direct the official correspondence, study the wants and interests of the whole University and exercise a general superintendence over all its concerns. His first care, and that of the authorities of the University, shall be the departments already established, and next those closely related to them; but no other department shall be established until those already introduced have been brought to the highest state of efficiency then possible. All acts, however, which shall involve the expenditure of money in the administration of the University's affairs, shall be subject to the approval of the Board of Trustees or the Finance Committee for the time being.

2. As the efficiency of a University depends chiefly upon the quality of its Faculty, the Board of Trustees will hold the President to a strict but reasonable accountability for the fidelity and ability of each instructor. The President only shall have the power to select and appoint all officers of instruction, subject to the approval of the Board of Trustees. To make wise and well-considered appointments, to maintain harmony within the Faculty, and to increase their efficiency in research and instruction shall be his most important duty. If at any time the President shall be negligent in the discharge of these or other duties, or is from any cause disabled from discharging them, they may be exercised by the Board of Trustees.

3. The President of the University shall be the medium of communication between the Trustees and Instructors, individually and collectively, upon all matters within the field of

action of either body. He shall attend all meetings of the Board of Trustees, of which he shall be notified, and shall participate in their deliberations, but without the power to vote. All complaints and requests from members of one body to the other shall be made through him.

4. The President shall call and preside over all official meetings of the Instructors, and a record of their proceedings shall be kept. These records are in no case to be made known to others than the Trustees. They shall always be in the custody of the President, but may be inspected by the Trustees, or either of them, at any time.

5. The President of the University, in the absence of the Trustees or Finance Committee, shall have the entire direction and control of the persons employed about the University and not engaged in the work of instruction; the duties of all such persons shall be assigned and they shall be appointed or removed by him, subject to the approval of the Finance Committee.

6. No instructor shall order any books or apparatus, or anything connected with the work of instruction (beyond his appropriation), without the approval of the President. No expense for the care of buildings or grounds, nor for alterations or repairs within and upon the same shall be made without the approval of the Board of Trustees or the Finance Committee, such alterations or repairs in no case to exceed the appropriations made for that purpose. If the Trustees, or Finance Committee,or any person, shall make contracts in behalf of the University without authority, the officer or person making such contract shall become individually responsible therefor.

7. The officers of instruction shall be appointed for a term of from one to five years. At the end of this period the work of each instructor will be subjected to a careful scrutiny upon the results of which his reappointment shall depend, always provided, however, that any Instructor will be liable to be dis-

charged at any time for incapacity, neglect of duty or for such other cause as shall seem good to the Trustees.

8. Each Instructor shall give stated lectures to however few. He shall actively and zealously strive to maintain the highest possible standard, shall work in a spirit of hearty sympathy and coöperation, and shall encourage research by precept and, if possible, by example.

9. The foregoing By-Laws are intended to embody the provisions contained in a vote passed by the corporation on the twenty-third day of May, A.D. 1889, upon the motion of Judge Devens. (See above.) If at any time hereafter any discrepancy shall be found to exist between the two, said By-Laws shall be so far modified as to conform to the provisions of said vote.

10. No instructor shall engage in any outside professional or technical pursuit without the approval of the Board, the Finance Committee, or the President.

11. These By-Laws, or any one of them, may be changed, amended, or repealed by a vote of three-fourths at least of the Trustees at any meeting of their Board duly called, notified, and held for that purpose.

GENERAL STATEMENTS

The University now consists of nine departments, in which all its work and that of Instructors, Fellows and Scholars is grouped.

These departments are as follows:

I. Mathematics
II. Physics
III. Chemistry
IV. Biology
V. Anthropology
VI. Psychology
VII. Pedagogy
VIII. Economics and Sociology
IX. History

The Faculty

The Faculty elect Fellows and take action upon general requirements for the Doctor's and Master's degrees and other promotions, act and advise upon whatever may be officially submitted to them by the Board or by the President, and consider all matters not otherwise provided for and in which all departments of the University are alike interested.

Admission

Only graduate students or those of equivalent attainments are admitted to full membership in the University, except in rare and special cases.

At present no entrance examinations are required; but by testimonials, diplomas, personal interviews, or written specimens of work, the authorities must be satisfied that the applicants have scholarship enough to work to advantage, and zeal and ability enough to devote themselves to their chosen field. The methods of the University are too costly, and its energy and funds too precious, to be spent upon those who are not well trained, promising and in earnest.

It is highly desirable that candidates entering any of the nine departments shall have, beside a knowledge of the other subjects commonly taught in colleges, a reading knowledge of French and German.

For the select students who are received, it is the purpose of the University to open all its privileges and to supply every incentive possible in the way of books, facilities, and, above all, direct personal stimulus. The chief as well as the best work of this University is individual and involves daily suggestion, encouragement and direction. The limited number of students permits more or less personal instruction in each case.

Classes of Appointees

No clearly marked line exists between students and instructors. Fellows who have attained some degree of mastery in a special line of work sometimes give brief special courses, which may be attended by professors.

This is a stimulus to the student, and both tests and exhibits power in teaching.

I. DOCENTS

The highest residential appointment not involving membership in the Faculty is that of Docent. These positions are designed for men of marked gifts and attainments who have at least attained the doctorate and wish to engage in research, teaching, or both.

Class A. Free Docents

Each docent of this class will be expected to deliver a limited number of lectures on some topic within his department. In so doing, he shall be entirely independent of other instructors both in his choice of special topic and his manner of treating it, and responsible only to the President of the University, by whom he shall be appointed after consultation with the head of the department. The free docent shall have command of the resources of the department in the way of books, apparatus, etc., so far as this does not interfere with its regular work. By establishing free docents, the Faculty desires not only to maintain and guarantee the fullest academic freedom, but to expose itself to all the stimulus that can come by the rivalry of younger or outside men, and to introduce new topics and new departures in old ones.

Class B. University Docents

A University docent shall engage in research and may collaborate with the head of the department or other

member of the Faculty and supplement his work. He shall be appointed by the head of the department with the approval of the President.

Habilitation of Docents

A docent of either class may prepare and read in public an habilitation address representing original work after a term of service of a length and under conditions to be determined by the Faculty for each individual case. Upon doing this, he may be formally presented with a certificate or diploma granting him the *venia docendi* or licentiate, which shall not be a title or degree, but shall attest his fitness as scholar or investigator for an academic position and shall be regarded by the University as a brevet collegiate professorship. The fee for such a certificate shall be $25, which the Faculty shall have power to remit. The compensation of a docent of either class, if any, shall be determined by the President, and the fees to be paid him by students, if any, shall be determined by the Bursar.

It is believed that the difficulties of college authorities in selecting suitable professors may be somewhat diminished by the existence of such a select body of scholars of guaranteed scientific training, ability, and approved power to teach, and that this new grade may aid in raising the standard of academic scholarship.

II. QUIZ MASTERS

Each member of the University Faculty may, with the approval of the President, appoint one or more quiz masters who with the aid of his lecture notes, or

otherwise, shall conduct review classes upon his lectures and who may hold preliminary tests, but who shall not lecture or give instruction save as review. These positions shall be regarded as honorary and as a privilege of more advanced students in perfecting their own knowledge and acquiring practice in instruction.

III. NON-RESIDENT LECTURERS

The representatives of each department may, with the approval of the President, bring eminent experts for exchange or other lectures of a special nature at any time during the academic year. They may also in return, with the approval of the President, give similar brief courses in other institutions, provided this does not interfere with their full efficiency for the work of this University.

IV. HONORARY FELLOWS

Those who have already advanced to the Doctor's degree may be appointed Honorary Fellows and given the privileges of the University, including those of the Library. In past years many who have already taken this degree, either in this country or abroad, and who are awaiting academic appointment, have found these positions both helpful for their own further research and development and also advantageous for obtaining the collegiate and university appointments that they seek.

V. CANDIDATES FOR THE DEGREE OF DOCTOR OF PHILOSOPHY

Candidates for the Doctor's degree must have previously taken the Degree of Bachelor of Arts or have had

a substantial equivalent for the training implied by that degree.

At least one year, but in most cases three years, of graduate work are necessary for this degree. Examinations for it, however, may be taken at any time during the academic year when, in the judgment of the University authorities, the candidate is prepared, provided the requirement of one year's residence has been absolved.

For this degree one requirement is a dissertation upon an approved subject, to which it must be an original contribution of value. To this capital importance is attached. It must be reported on in writing by the chief instructor before the examination, printed at the expense of the candidate, and at least one hundred copies given to the University. However, in case of a dissertation of unusual length, or containing expensive plates, the Faculty shall have power, at the request of the candidate, to reduce this number of presentation copies to fifty.

Such formal or informal tests as the Faculty may determine shall mark the acceptance of each student or Fellow as a candidate for this degree. One object of this preliminary test shall be to insure a good reading knowledge of French and German. Such formal candidature shall precede the examination itself by a period prescribed in the special rules below.

The fee for the Doctor's degree is $25, payable before the examination. The presentation copies of the dissertation must be in the hands of the Librarian before the diploma is delivered. In exceptional cases, and by special action of the Faculty, the act of promotion may precede the presentation of the printed copies of the dissertation.

An oral, but no written, examination is required upon at least one minor subject in addition to the major before an examining jury composed of at least four members, including the head of the department and the President of the University, who is authorized to invite any person from within or without the University to be present and to ask questions. The jury shall report the results of the examination to the Faculty, who will recommend satisfactory candidates for the degree.

For the bestowal of this degree, the approbation of the Board of Trustees must in each case be obtained by their signature upon the diploma. They desire that the standard of requirements for it be kept the highest practicable, that it be reserved for those of superior ability and attainment only, and that its value be never suffered to depreciate.

It is to the needs of candidates for this degree that the lectures, seminaries, laboratories, collections of books, apparatus, etc., are especially shaped, and no pains will be spared to afford them every needed stimulus and opportunity. It is for them that the Fellowships and Scholarships are primarily intended, although any of these honors may be awarded to others.

On November 14th, 1900, the following vote was passed by the Board of Trustees:

That the University will admit candidates for the degree of Doctor of Philosophy and will confer that degree without regard to sex.

Special Rules concerning the Doctor's Degree

I. *Residence.* No candidate shall receive the degree of Doctor of Philosophy without at least one academic year's previous residence.

II. *Candidature for the Doctor's Degree.* Every applicant for the Doctor's degree shall fill out, before October fifteenth, the regular application blank provided at the office. This schedule shall be submitted to the head of the department. Before affixing his signature he shall satisfy himself, in such manner as he may desire, as to the fitness of the applicant.

III. When countersigned, this schedule shall be filed with the President, and the applicant will be examined in French and German by the annual committee for that purpose.

IV. In case of a favorable report by this committee, the applicant shall be a regular candidate for the degree.

V. Candidates complying with all preliminary conditions, including the examinations in French and German, before November first will be allowed to proceed to the doctor's examination at any time between May fifteenth following and the end of the academic year.

VI. *The Doctor's Dissertation.* The dissertation must be presented to the instructor under whose direction it is written, and reported upon by him before the doctor's examination. In every case the dissertation shall be laid before the jury of examination, at the time of examination, in form suitable for publication. This provision shall not, however, preclude the making of such minor changes later as the chief instructor may approve.

VII. The dissertation shall be printed at the expense of the candidate and the required copies deposited with the Librarian within one calendar year after the first of October following the examination. The candidate alone will be held responsible for the fulfilment of these conditions.

VIII. The favorable report of the chief instructor, filed in writing with the Clerk of the University, shall be a sufficient imprimatur or authorization for printing as a dissertation. The printed copies shall bear upon the cover and title page the statement of approval in the following words, over the signature of the chief instructor:

> A Dissertation submitted to the Faculty of Clark University, Worcester, Mass., in partial fulfilment of the requirements for the degree of Doctor of Philosophy, and accepted on the recommendation of
>
> (NAME OF CHIEF INSTRUCTOR)

IX. *Examinations for the Doctor's Degree.* The examinations for the doctor's degree may be held at any time during the academic year, provided that at least one academic year has elapsed since the completion of the preliminaries of candidature, except in the case of fulfilment of these conditions between the beginning of any academic year and November first of that year, to which case Rule V applies. The examinations shall be held at such hours and places as the President may appoint.

X. Examinations may also be held during the regular vacations of the University, but for these an additional fee of five dollars to each examiner and the reasonable travelling expenses of any examiners who are out of town, all payable in advance, will be required.

VI. CANDIDATES FOR THE DEGREE OF MASTER OF ARTS

This degree is conferred upon candidates who comply with the following requirements:

1. The candidate shall have previously taken the degree of Bachelor of Arts, or have had a substantial

equivalent for the training implied by that degree, to be determined by special vote of the Faculty; but such degree or training must involve a good preparation for the work proposed for the Master's degree, in order that it may be accepted.

2. The candidate must devote a full academic year to post-graduate work in this University after receiving the Bachelor's degree or the training accepted as its equivalent. This work shall be mainly in one department, but the candidate may do also such other work as shall be advised by the head of his principal department —whose approval of the whole course shall be necessary. In particular cases, the candidate may be allowed, by special vote of the Faculty, to divide his work between two years; but the aggregate must, in all cases, amount to a full year's work, at least.

3. The candidate must satisfy the representatives of his principal department that he has done his work faithfully and has mastered the subjects involved, by such written and oral examinations and other tests as the department may require. The head of the department shall make a written report to the Faculty of the grounds on which the candidate is recommended, specifying the amount and character of his work, and this report shall be filed in the office.

4. The candidate must present a thesis or written report on some topic included in his course or closely related to it, that shall receive the approval of the representatives of his principal department, be accepted by the Faculty, and filed in the office.

5. Every candidate recommended for the Master's degree shall pay a fee of ten dollars.

6. The Master's degree will be conferred at the annual commencement in June of any year on those candidates only who shall have made written application to be considered as such on or before January 15th preceding and shall have fulfilled all the conditions here specified at least one week before Commencement, at which time the academic year shall be regarded as ending for the purposes of section 2.

VII. SPECIAL STUDENTS NOT CANDIDATES FOR A DEGREE

Any one desiring to undertake a special and approved line of research, and whose attainments are such as to satisfy the requirements of the University, may also be received. This class includes persons who may desire to devote themselves exclusively to one or more of the special branches—mathematics, physics, chemistry, biology, anthropology, psychology, pedagogy, economics and sociology, or history—but who do not care to matriculate or become candidates for a degree.

These students, provided they satisfy the heads of the departments of their training and competency in one subject, in which they must be advanced (although they may be less so, or even beginners, in other subjects), may be allowed entire freedom in their choice and combination of studies, and as special students may enjoy all the privileges of the University.

These students may, with the approval of the President, be received for less than an entire year.

VIII. PRELIMINARY CANDIDATES

Non-university students of less special or less advanced standing than the above classes, who contemplate becoming candidates for some higher degree, may also be received.

Students of this class must satisfy the authorities of the University of their attainments and that they contemplate advancing to a degree higher than that of A.B. The privileges and status of these students will be more fully defined later. They may, in exceptional cases, be elected to Scholarships.

Fellowships and Scholarships

From the George F. Hoar Fund of $100,000 provided by the generosity of Andrew Carnegie, the sum of $3,000 is now available for Junior and Senior Fellowships in the University. While the sums attached to these appointments are not fixed, a Senior Fellow may receive $200 together with the remission of fees; which makes the value of the appointment $300. A Junior Fellow may receive $100 with remission of fees, which makes the value of the appointment $200. Besides these, other appointments of Senior and Junior University Scholarships, with remission of fees, are made.

A CITIZEN'S FUND

A citizen of Worcester has given a fund of $5,000, the income of which is to be used for the aid of "some one or more worthy native born citizens of the city of Worcester who may desire to avail themselves of the advantages of the institution."

Mrs. Eliza W. Field has also given $500 to be called the "John White Field Fund," the income of which is "to provide for the minor needs of a Scholar or Fellow."

The following regulations apply to the award of the income of the Field Fund:

1. Regard is had to the intellectual ability of the candidate as well as to need of pecuniary assistance.

2. Only candidates who have spent three months at the University are considered.

3. The head of each department will consider and report to the Faculty desirable cases in his department.

4. Applications are received not later than December 15th, and the awards made as soon as possible after the Christmas recess.

THE ELIZA D. DODGE FUND

Mrs. Dodge has given $1,000 to be known as the "Eliza D. Dodge Fund," the income only to be expended in aid of graduate students of limited means engaged in research work.

PURPOSE AND CONDITIONS OF FELLOWSHIPS AND SCHOLARSHIPS

Fellowships at Clark University are intended for young men and women of promise who desire to pursue post-graduate studies in order to fit themselves for intellectual careers. It is desirable, but not required, that candidates for these positions should intend to proceed to the degree of Doctor of Philosophy or to equivalent attainments. In general, those intending to devote themselves to some

special branch of learning are preferred to those directly fitting themselves for one of the three learned professions, although the latter are not excluded.

No application blanks are provided, but it is desired that the candidate should state fully and in writing his previous course of study and submit testimonials or diplomas, especially such as indicate a decided preference for some particular department. These should be accompanied also, if practicable, by some specimen of the candidate's work. Applications will be considered in May and in October and should be in the hands of the President on or before the first day of either month. In special cases vacancies may be filled by appointments at any time during the year. The names of unsuccessful candidates will not be made public.

Fellows must reside in Worcester during the entire academic year, devote themselves to special studies under the direction of their instructors, and give such evidence of progress or proficiency before the end of the year as the authorities shall require. It is generally expected that they will undertake some work of research during the year. They must coöperate in promoting harmony, order, and all the ends of the University, must not teach elsewhere, and may be reappointed at the end of the year. Being intended primarily as honors, both Fellowships and Scholarships are awarded without reference to pecuniary needs, so that those Fellows able and desiring to do so may relinquish the emolument and retain the title.

The paying fellowships will, for the present, be restricted to the departments of mathematics, physics, chemistry, biology, psychology, pedagogy, anthropology, and history.

Besides field work, excursions to institutions (public and private), coaching and cram classes, clubs, examinations, and other modes by which knowledge now seems best imparted and retained, the following educational methods are prominent:

Lectures. The Trustees desire that each instructor, of however few students, should prepare and deliver regular lecture courses, with diagrams, illustrative apparatus, and reference to standard text-books and the best current literature upon each topic. Advanced students are also encouraged to supplement the work of the professors by giving occasional special lectures and courses. Public lectures will be given from time to time.

Seminaries and Conferences. These are stated meetings for joint systematic work, under the personal direction of the professor, in some special part of his subject. Here students preparing theses and papers for publication in the journals edited at the University read them in incomplete form for mutual criticism and help. Here, also, the results of individual reading are reported for the benefit of all; views are freely criticised; new inquiries, methods, comparisons, standpoints, etc., suggested. From the mutual stimulus thus given many important works have proceeded and the efficiency of universities has been greatly increased.

Laboratory Work. For beginners this has been from the first the best of all forms of apprenticeship, bringing student and professor to a closer and mutually stimulating relation. Here the manipulation of apparatus is learned, processes are criticised, results obtained

by other investigators are tested, and methods discussed and perfected, with a view to developing that independence in research which is the consummation of scientific culture.

Notices

The charge for tuition, giving all the privileges of the University, but not covering the laboratory fees, is $100 per annum.

Board and lodging can be obtained near the University at very moderate rates.

Intending students will be given information, so far as possible, upon any of these or other points, in advance of official announcement, upon addressing the Clerk of the University, Miss Florence Chandler, Worcester, Mass.

All members of the University are expected to be present at the opening of each term and to continue in attendance to its close.

The following are the statements and announcements of the departments for the academic year, 1914–1915.

I. MATHEMATICS

Programme for 1914–1915

Instruction in Mathematics

The chief aim of the department is to make independent investigators of such students as have mathematical taste and ability; these naturally look forward to careers as teachers of the higher mathematics in colleges and universities, and we believe that the course of training best adapted to the development of investigators is also that which is most suitable for all who would be efficient college professors, even if they are not ambitious to engage in research. The first essential of success in either of these lines is the habit of mathematical thought, and the direct object of our instruction is the acquisition of this habit by each of our students. With this end in view, we expect every student to make himself familiar with the general methods and most salient results of a large number of different branches of mathematics, conversant with the detailed results and the literature of a few branches, and thorough master of at least one special topic to the extent of making a real contribution to our knowledge of that subject.

In accordance with these principles, the instruction is given by means of introductory, advanced and special courses of lectures, seminaries, and personal guidance in reading and investigation.

The introductory courses (mostly given in alternate years) treat the following subjects:

Analytic Geometry of Conics, Higher Plane Curves, Quadrics, Higher Surfaces, and Twisted Curves; 5 hours a week, through the year.

DIFFERENTIAL EQUATIONS, AND CALCULUS OF VARIATIONS; 5 hours a week, through the year.

THEORY OF FUNCTIONS OF REAL AND IMAGINARY VARIABLES, ELLIPTIC FUNCTIONS, AND DEFINITE INTEGRALS; 5 hours a week, through the year.

THEORY OF NUMBERS; 2 hours a week, one half-year.

HIGHER ALGEBRA; 5 hours a week, through the year.

ALGEBRAIC SUBSTITUTIONS AND THEIR APPLICATION TO THE THEORY OF EQUATIONS; 2 hours a week, one half-year.

ALGEBRAIC INVARIANTS; 2 hours a week, one half-year.

FINITE DIFFERENCES; 2 hours a week, one half-year.

It is expected that every student will take each course in the earliest year of his residence in which it is given, unless he has already completed an equivalent course elsewhere. The chief object of these courses is to make the student familiar with the various methods of mathematical research and the concepts of mathematical thought at the present day. Thus, for example, curves and surfaces are treated by modern methods from the beginning, with adequate consideration of the discoveries of the great geometers of recent times. The usual college courses in the theory of algebraic equations, analytic geometry, and the differential and integral calculus furnish all the necessary preparation for these introductory courses, although it is very desirable that the student be acquainted with the properties of determinants and their application to the solution of linear equations, and with the methods of solving differential equations of the simpler types. Deficiencies in these subjects may be made up by attendance on the corresponding courses in the Collegiate Department of the University.

Special advanced courses, open to all who are prepared for them, are given annually in subjects varying with the interests of the instructors and the needs of the students. These advanced courses are not repeated at regular intervals, but properly prepared students will receive the personal assistance of one or other of the instructors in reading any

subject not announced for the year in which they desire to take it.

The number and scope of the advanced courses given each year have been, thus far, regulated by the number of students qualified to profit by them and by the individual interests of the instructors; these courses will be increased, both in number and variety, whenever a real demand for such an increase shall make itself apparent. While the present purely scientific character of the University precludes instruction in strictly technical branches, we hope that the time is not far distant when the demand shall make it advisable, and increased facilities shall make it possible, to announce courses in Descriptive Geometry, Graphical Statics, Mathematical Astronomy, Vital Probabilities, and all the more important applications of mathematics to other sciences and to technical subjects. The applications of mathematics to physics already receive adequate consideration, and the further extension of such applications awaits only a demand for it on the part of students.

The subjects in which advanced courses may be expected to be given every few years include the following:

History of Mathematics.

Arithmetic: Numerical computations; Theory of numbers; Finite differences and the Calculus of operations; Probabilities and the Theory of errors.

Algebra: Substitution-groups and the Galois theory of equations; Invariants; Quadratic forms; Simultaneous equations (including Restricted systems); Multiple algebra.

Higher Analysis: Differential equations, ordinary and partial; Continuous groups; Definite integrals and Fourier's series.

Theory of Functions: Functions of real and complex variables; Point-aggregates; Elliptic functions; Abelian integrals.

Geometry: Modern synthetic geometry; Analytic geometry of higher plane curves, higher surfaces, and twisted curves; Rational and uniform transformations of curves and surfaces; Infinitesimal geometry; Analysis situs; Quaternions; Hyperspace and non-euclidean geometry.

Symbolic Logic.

Other courses will be given whenever there is a demand for them, as in the past. The instructors are always glad to assist students in any line of mathematics that falls within the range of their own studies. The small number of students makes it possible to give personal attention to individuals, and the intimate and confidential relation thus established between pupil and teacher is an advantage that cannot be overestimated and ought not to be left out of account by the prospective student in determining where his studies shall be pursued.

For the academic year 1914–15, the following courses of lectures are announced:

BY PROFESSOR STORY

Introductory Course:

ANALYTIC GEOMETRY OF HIGHER PLANE CURVES, HIGHER SURFACES, AND TWISTED CURVES; 3 hours a week, through the year.

Advanced Courses:

CALCULUS OF OPERATIONS AND FINITE DIFFERENCES; 3 hours a week, through the year.

THEORY OF ERRORS; 3 hours a week, first half-year.

HISTORY OF MATHEMATICS; 3 hours a week, second half-year.

SEMINARY FOR ADVANCED STUDENTS; through the year.

BY PROFESSOR TABER

Introductory Course:

THEORY OF FUNCTIONS OF REAL AND IMAGINARY VARIABLES, ELLIPTIC FUNCTIONS AND DEFINITE INTEGRALS; 5 hours a week, through the year.

Advanced Courses:

GALOIS THEORY OF ALGEBRAIC EQUATIONS; 1 hour a week, through the year.

INTEGRAL EQUATIONS; 1 hour a week, through the year.

SEMINARY; through the year.

BY PROFESSOR WEBSTER

[See announcement of Department of Physics, courses 10, 11, 13, 14.]

BY M. DE PEROTT

Introductory Course:

THEORY OF NUMBERS; 2 hours a week, first half-year.

Advanced Course:

ABELIAN INTEGRALS; 2 hours a week, second half-year.

BY DR. WILLIAMS

Introductory Course:

CONIC SECTIONS AND QUADRIC SURFACES; 2 hours a week, through the year.

While desirous of supplying all possible facilities to those who wish to pursue studies in special branches, and to those who, already occupying permanent positions, have but a limited leave of absence, we have made it our chief object to provide a thorough training for those who, having just completed a college course, have not yet entered upon their life-work. This provision consists of such courses of lectures, seminaries, and individual assistance as should enable a faithful student endowed with the proper natural ability to satisfy the requirements for the degree of Doctor of Philosophy at the end of his third year with us. The requirements for this degree have been determined by our conception of the ideal teacher, as already stated. To acquire the necessary breadth of knowledge of mathematics as a whole, the candidate is expected to attend, during his first two years, specified introductory courses of lectures on the general principles, methods, and results of all the more important branches of pure mathematics, to supplement these lectures by private reading and to take an active part in the seminary. In the seminary, a special topic more or less directly connected with the subject of some lecture, is assigned, from time to time, to each student, who is required to read it up and make an oral report upon it before the class. Each candidate for the Doctor's

degree is expected to attend a number of advanced courses. He spends the greater part of his third year in the original investigation, under the constant personal guidance of one of the instructors, of a topic of his own selection. In preparing for this investigation he is required to make a practically complete bibliography of the subject and to read all the more important available articles that have been written on it. The results of the investigation, embodied in a dissertation suitable for printing, must be submitted to the instructor under whose direction the work was done, and must receive his approval before the candidate will be admitted to the final examination for the degree. This approval will not be given unless the dissertation is satisfactory in form and completeness and the results are sufficiently novel and important to constitute a real contribution to science. The dissertation is, in fact, the main criterion by which the candidate is judged, and no amount of other work will compensate for its defects.

Each of the instructors is engaged in research and has always a number of investigations planned for himself, which have often been carried to a well advanced stage but are not completed for want of time. Such incomplete investigations are given to properly prepared candidates for the Doctor's degree, and they receive from the instructor all the assistance necessary for the completion of the work, thus becoming, to a certain extent, collaborateurs with the instructor.

The preparation of a bibliography of any topic is greatly facilitated by a classified index of mathematical literature on the card-catalogue plan, which has been prepared under the supervision of Professor Story and now includes over one hundred thousand titles of periodical articles, separate memoirs, and books in all fields of pure mathematics. This index is much more complete than the Royal Society's

catalogue, even in the restricted field of that catalogue (periodicals published between 1800 and 1900), and will be extended as rapidly as possible.

The ability of our graduates to carry on research and the excellence of the work actually done is assured by the regulation that each dissertation accepted by us as worthy of the degree shall be printed with the explicit approval of a member of our Faculty. It is evident that, whereas any one that has the necessary preparation and taste for mathematics may profit by the advantages here afforded, only those who have a certain amount of mathematical genius can secure the degree.

In making appointments to fellowships and scholarships we have endeavored to maintain the same high standard. We are on the lookout for mathematical geniuses; but it is difficult to determine from the evidence of others whether candidates come up to our standard or not; so that we have adopted the general policy of giving the best appointments to those only that have been with us for at least one year, and about whom we are in position to judge for ourselves. Of course, this policy could not be carried out during the earlier years of the University, and its effect is apparent in the fact that, whereas seventy-five per cent of the students that entered the mathematical department during the first three years remained with us but one year, only thirty-three per cent. of those that have been admitted from 1892 to the present time left at the end of their first year. We do not mean to imply that those who left before completing our course were inferior in ability to those who remained three years, but we desire particularly to encourage men who can and will go forward to the degree.

Nearly all of those who have studied mathematics with us have adopted teaching as a profession, sixty-eight per cent are now members of college faculties, and thirteen per

cent are engaged in higher school work. Those who have received the doctor's degree have generally secured at once desirable positions in which to begin their life-work, and most of them have already acquired for themselves, by distinguished ability, very decided influence in the institutions with which they are connected.

The degree of Master of Arts will be conferred upon students who complete with credit an approved course of one year and present a satisfactory thesis.

Every facility for the study of special branches will be given to properly prepared students who are not candidates for a degree, as also to those who, having already attained to the Doctor's degree (here or elsewhere), wish to continue mathematical study or investigation.

Material Facilities

The library is provided with the more important text-books, treatises, and memoirs on the various branches of mathematics, as well as the principal journals and transactions of learned societies that are devoted to any considerable extent to mathematics. A list of these journals will be found below.

The mathematical department possesses a good collection of models, a Thomas arithmometer, and an Amsler planimeter with revolving table.

List of Journals Relating to the Exact Sciences in the University Library

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Amsterdam.

Koninklijke akademie van wetenschappen. Verhandelingen, 1854 to date. Complete.

Revue semestrielle des publications mathématiques. 1893 to date. Complete.

Baltimore.

American chemical journal. 1879 to date. Complete.

American journal of mathematics. 1878 to date. Complete.

BANGKOK.

Siam society. Journal. 1905-07.

BERLIN.

Berliner mathematische Gesellschaft. Sitzungsberichte. 1902 to date. Complete.

Chemisches Centralblatt. 1897 to date. Complete.

Deutsche chemische Gesellschaft. Berichte. 1868 to date. Complete.

Fortschritte der Physik. 1847 to date. Complete.

Jahrbuch über die Fortschritte der Mathematik. 1868 to date. Complete.

Journal für die reine und angewandte Mathematik. 1826 to date. Complete.

Königlich-preussische Akademie der Wissenschaften. Mathematische und naturwissenschaftliche Mittheilungen aus den Sitzungsberichten. 1882-97. Complete.

Zeitschrift für angewandte Chemie. 1888 to date. Complete.

BOLOGNA.

Istituto di. Bologna. Reale academia delle scienze.

Commentarii. 1731-1791. Complete.

Novi commentarii. 1834-1849.

Memorie fis. e mat. 1806-1910.

Memorie. 1850 to date. Complete.

Scientia; rivista di scienza. 1910 to date. Complete.

BOSTON.

American academy of arts and sciences. Procesdings. 1870 to date. Complete.

North American Review. 1815–1886.

Technology review. 1899 to date. Complete.

BOULDER, COLORADO.

University of Colorado. Studies. 1902 to date. Complete.

BRAUNSCHWEIG.

Deutsche physikalische Gesellschaft. Berichte. 1903 to date. Complete.

Jahresbericht über die Fortschritte der Chemie. 1847 to date. Complete.

BRESLAU.

Kaiserlich-Leopoldinisch-carolinische deutsche Akademie der Naturforscher. 1843.

BRUXELLES.

Académie royale des sciences des lettres et des beaux-arts de Belgique.

Bulletins. Ser. 3. 1889 to date.

Mémoires couronnés et mémories des savants étrangers. 1889-90.

CAMBRIDGE, ENGLAND.

Cambridge philosophical society.

Proceedings. 1843 to date. Complete.

Transactions. 1822 to date. Complete.

CAMBRIDGE, MASSACHUSETTS.

Science. 1883 to date. Complete.

CHARLOTTESVILLE, VIRGINIA.

Annals of mathematics. 1884 to date. Complete.

CHICAGO.

Astrophysical journal. 1895 to date. Complete.

School science and mathematics. 1901 to date. Complete except vol. 13, Nos. 1-2.

Terrestrial magnetism. 1896 to date. Complete.

COLUMBIA, MISSOURI.

University of Missouri studies. Science series. vol. 1. 1905-07.

DRESDEN.

Zeitschrift für Chemie und Industrie der Kolloide. 1906 to date. Complete.

EASTON, PENNSYLVANIA.

American chemical society.

Chemical abstracts. 1907 to date. Complete.

Journal. 1879 to date. Complete.

Proceedings. 1878 to date. Complete.

Journal of industrial and engineering chemistry. 1909 to date. Complete.

EDINBURGH.

Edinburgh mathematical society. Proceedings. 1884-1907.

Edinburgh philosophical journal. 1819-1826.

Edinburgh royal society transactions. 1873 to date. Complete.

GÖTTINGEN.

Königliche Gesellschaft der Wissenschaften. Nachrichten von der k. Gesellschaft der Wissenschaften und der Georg-Augusts-universität. 1853 to date.

GREIFSWALD.

Archiv der Mathematik und Physik. 1901 to date.

HAARLEM.

Hollandsche maatschappij der wetenschappen. Archives néerlandaises des science exactes et naturelles. 1866 to date. Complete.

HALIFAX.

Nova Scotian institute of science.

Proceedings and transactions. Halifax. 1890 to date. Complete.

HALLE.

Zeitschrift für Electrochemie. 1895 to date. Complete.

HAMBURG.

Mathematische Gesellschaft. Mittheilungen. 1890 to date. Complete.

Zeitschrift für anorganische Chemie. 1892 to date. Complete.

HEIDELBERG.

Annalen der Chemie. 1832 to date. Complete.

INDIANAPOLIS.

Indiana academy of science. Proceedings. 1895-98.

ITHACA.

Journal of physical chemistry. 1896 to date. Complete.

LAWRENCE, KANSAS.

Kansas University science bulletin. 1902-1908.

LEIPZIG.

Acta Eruditorum, 1682-1731. 50 vols. Supplementa, 1692-1734. 10 vols. Indices generales, 1693-1733. 10 vols. in 5.

Nova Acta Eruditorum, 1732-1782. 13 vols. Supplementa, 1735-1739. 3 vols. in 2.

Annalen der Physik. 1824 to date. Beiblätter, 1889 to date. Complete.

Archiv für Optik. vol. 1. 1908.

Chemische Novitäten. 1905-08.

Deutsche Mathematiker-vereinigung. Jahresbericht. 1890 to date. Complete.

Encyklopädie der mathematischen Wissenschaften mit Einschluss ihrer Anwendungen.

Fortschritte der Chemie, Physik und physikalischen Chemie. 1909.

Internationale Mathematiker-congresse. Verhandlungen. 1897 to date. Complete.

Jahrbuch der drahtlosen Telegraphie und Telephonie. 1908 to date. Complete.

Jahresbericht über die Leistungen der chemischen Technologie. 1856 to date. Complete.

LEIPZIG (Continued).

Journal für praktische Chemie. 1834 to date. Complete.
Königlich-sächsische Gesellschaft der Wissenschaften.
Berichte über die Verhandlungen der mathematisch-physischen Classe. 1849 to date. Complete.
Abhandlungen der mathematisch-physischen Classe. 1852 to date. Complete.
Mathematische Annalen. 1869 to date. Complete.
Zeitschrift für Chemie. 1866-71.
Zeitschrift für Mathematik und Physik. 1856 to date. Complete.
Zeitschrift für physikalische Chemie. 1887 to date. Complete.
Zeitschrift für mathematische und naturwissenschaftliche Unterricht. 1903 to date.
Zeitschrift für wissenschaftliche Photographie, Photophysik und Photochemie. 1903 to date. Complete.

LIÈGE.

Société royale des sciences. Mémoires. 1843 to date. Complete.

LONDON.

British academy. Proceedings. 1905. 1907.
British association for the advancement of science. Reports. 1831 to date. Complete.
Chemical news and journal of physical science. 1904 to date. Complete.
Chemical society of London.
Annual reports on the progress of chemistry. 1905 to date. Complete.
Journal. 1849 to date. Complete.
Electrician. 1891 to date. Complete.
International catalogue of scientific literature. 1902 to date. Complete.
London mathematical society. Proceedings. 1865 to date. Complete.
Royal Society.
Proceedings. 1800 to date. Complete.
Philosophical transactions. 1665 to date. Complete.
Mathematical gazette. 1896 to date. Complete.
Nature. 1870 to date. Complete.
Nineteenth century. 1877 to date. Complete.
Philosophical magazine. 1798 to date. Complete.
Physical Society of London. 1876 to date. Complete.
Quarterly journal of pure and applied mathematics. 1857 to date. Complete.
Quarterly review. 1809-1885.
Science abstracts. 1898 to date. Complete.
Science progress in the 20th century. 1907 to date. Complete.

MADISON.

Wisconsin academy of arts and sciences. Transactions. 1898.

MANILA.

Philippine journal of science. 1906 to date. Complete.

MILANO.

Annali di matematica, pura ed applicata. 1889 to date.
Reale istituto lombardo di scienze e lettere. Classe di scienze mathematicech naturali.
Rendiconti. 1864-67. Complete.
Rendiconti. 1868 to date. Complete.
Memorie. 1843 to date. Complete.

MONTREAL.

Royal society of Canada. Proceedings and transactions. 1882-1906.

München.

Königlich bayerische Akademie der wissenschaften. Sitzungsberichte der mathematisch physikalischen Klasse. 1871 to date. Complete.

NEW HAVEN.

American journal of science and arts. 1871 to date. Complete.

NEW YORK.

American mathematical society.

Annual register. 1892 to date. Complete.

Bulletin. 1894 to date. Complete.

Transactions. 1900 to date. Complete.

American society of biological chemists. Proceedings. 1907 to date. Complete.

Appleton's journal of literature, science and art. 1869-76.

Electrical world and engineer. 1907 to date. Complete.

Journal of biological chemistry. 1905 to date. Complete.

The Minerva. 1824-26.

New York Mathematical Society. Bulletin. 1891-94. Complete.

Popular science monthly. 1872 to date. Complete.

Physical review. 1894 to date. Complete.

OXFORD.

Messenger of mathematics. 1862 to date. Complete.

PALERMO.

Circolo matematico di Palermo. Rendiconti. 1887 to date. Complete.

PARIS.

Annales de Chemie et de physique. 1789-1908.

Annales scientifiques de l'École normale supérieure. 1864 to date. Complete.

Association française pour l'advancement des Sciences. Comptes rendus des sessions. 1873 to date. Complete.

Bulletin des sciences mathématiques. 1870 to date. Complete.

Bureau international des poids et mesures. 1881 to date. Complete.

École polytechnique. Journal. 1794 to date. Complete.

Institut de France. Académie des sciences. Comptes rendus hebdomadaires des séances. 1835 to date. Complete.

Journal de mathématiques pures et appliquées. 1836 to date. Complete.

L'éclairage électrique. 1894-1907.

L'enseigmement mathématique. 1899 to date. Complete.

Nouvelles annales de mathématiques. 1842 to date. Complete.

Revue des deux mondes. 1908 to date. Complete.

Revue générale des sciences pures et appliquées. 1903 to date. Complete.

Revue scientifique. 1863 to date. Complete.

Société chimique de Paris. Bulletin. 1858 to date. Complete

Société mathématique de France. Bulletin. 1873 to date. Complete.

ST. PETERSBURG.

Journal of physical chemistry. (Russian Text.) Chemical section and physical section. 1909 to date.

PHILADELPHIA.

Academy of natural sciences of Philadelphia. Proceedings. 1890 to date. Complete.

American electrochemical society. Transactions. 1902 to date. Complete.

Lippincott's magazine of literature, science and education. 1868-1881.

PISA.

Il Nuovo Cimento. 1891 to date. Complete.

ROME.

Reale accademia dei lincei. Atti. Rendiconti. etc. 1847 to date.

SACRAMENTO.

Lick observatory. Publications. 1887-1903.

SALEM, MASSACHUSETTS.

American Association for the advancement of science. Proceedings. 1848 to date. Complete.

SIDNEY.

Australasian association for the advancement of science. 1888 to date. Complete.

STOCKHOLM.

Acta mathematica. 1882 to date. Complete.

Arkiv för matematik, Astronomi och fysik. 1903 to date. Complete.

Bibliotheca mathematica. 1884 to date. Complete.

STRASSBURG.

Zeitschrift für physiologische Chemie. 1877 to date. Complete.

STUTTGART.

Jarhbuch der organischen Chemie. 1908. to date. Complete.

Sammlung Chemischer und chemisch-technischer Vorträge. 1896 to date. Complete.

TOKYO.

Journal of the College of Science of the Imperial University of Japan.

Mathematico-physical society. Proceedings (Tôkyô sûgakubuturigakkwai kizi). 2nd Ser. 1901 to date. Complete.

TOULOUSE.

Université de Toulouse. Faculté des sciences. Annales. 1887 to date. Complete.

URBANA, ILLINOIS.

University of Illinois. University studies. 1900-1908.

WASHINGTON, D. C.

National academy of sciences.

Biographical memoirs. 1877 to date. Complete.

Memoirs. 1883-1902.

Reports. 1883 to date. Complete.

U. S. Bureau of Standards. Bulletin. 1905 to date. Complete.

U. S. Naval observatory. Publications 1900-1903.

U. S. Naval observatory. Astronomical and meteorological observations. 1885-89.

WIESBADEN.

Zeitschrift für analytische Chemie. 1862 to date. Complete.

WIEN.

Kaiserliche Akademie der Wissenschaften.

Denkschirften; mathematisch-naturwissenschaftliche Classe. 1850-1908.

Sitzungsberichte der mathematisch-naturwissenschaftlichen Classe. 1848 to date. Complete.

Monatshefte für Mathematik u. Physik. 1908.

Monatshefte für Chemie und verwandte Theile anderer Wissenschaften. 1881 to date. Complete.

WORCESTER.

The Mathematical review. 1896–97.

II. PHYSICS

The Department of Physics of Clark University is exclusively a department for graduate study and research in pure and applied physics. In order to set forth to the intending student the facilities of this department, stress may be laid on a number of points in which it is believed that the conditions here are exceptional.

First, the fact that the attention of the professor is not distracted from the needs of the student by other duties, which, combined with the small number of students in the department, enables an amount of personal attention to be given to each one which is perhaps unique in this country. The head of the department is able to see each student and to give him personal advice in the conduct of his researches or his studies every day if necessary. The facilities without which no graduate department of research in physics can be complete are comprised under three heads: first, a systematic course of lectures in theoretical or mathematical physics; second, a laboratory with a sufficient number of rooms for individual work and with a sufficient equipment of apparatus and an instrument shop for the speedy production of whatever may be necessary for the research in hand; third, a library containing the classic works on physics, with full sets of journals and proceedings of learned societies by which the history of progress, past and present, may be studied, and kept up-to-date by the continual purchase of the latest works. In all these directions the facilities offered by this department invite attention.

The lecture courses are so arranged as to cover in a cycle

of two years all the principal subjects and methods of theoretical physics. The pursuit of them will fit the student to read and study with facility any memoirs on mathematical physics. The courses are so arranged that, although they follow in order, it is possible for a student to begin in either year of the cycle. The regular courses are those not marked with a star, and constitute a course of from five to seven hours weekly. The starred courses are delivered at irregular intervals, according to the demands or the presence of students of sufficient advancement.

LECTURES

1. Dynamics. General Principles, Equations of Lagrange and Hamilton, Methods of Hamilton and Jacobi, Systems of Particles, Rigid Bodies.

This course is fundamental for the pursuit of all the others, and includes a detailed account of the principle of Least Action and the differential equations of Lagrange, preparatory to their application to other parts of mathematical physics such as optics and electricity.

2. Newtonian and Logarithmic Potential Functions, Attraction of Ellipsoids.

This course is a necessary preliminary to the study of electricity and magnetism, of hydrodynamics, and of the figure of the earth.

3. Elasticity, Hydrodynamics, Wave and Vortex Motion, Dynamical Basis of Sound and Light.

This course is the basis of applications of the theory of wave motion to sound, light, electro-magnetism, and earthquake waves, and to the study of meteorology.

3a. * Dynamics of Cyclic and Oscillatory Systems, with Applications to the Theory of Electricity, Sound and Light.

The substance of the preceding courses is contained in Professor Webster's Treatise on Dynamics, B. G. Teubner, Leipzig.

3b. * The Theory of Resonance with Applications to the Measurement of Sound and to Wireless Telegraphy.

This course takes up Professor Webster's original researches in acoustics, and also shows how the methods there employed bear on the fundamental electrical phenomena involved in wireless telegraphy.

4. Electricity and Magnetism. The Classical Theories and the Theory of Maxwell, with an account of the principal methods for the solution of problems and applications to absolute measurements.

The substance of this course is found in Professor Webster's Mathematical Treatise on the Theory of Electricity and Magnetism, London, Macmillan & Co.

4a. * Recent Developments in Electrical Theory, including the Theory of Lorentz and the Principle of Relativity.

The application to the theory of electrons and to the optics of bodies in motion.

5. The Theory of Light. Propagation of Light, Diffraction, Reflection and Refraction, Dispersion, Double Refraction, Polarization, Metallic Reflection, Magneto-optics.

5a. * Comparison of Theories of the Ether.

Critical and historical examination of the various mechanical explanations of the luminiferous ether, including those of Green, McCullagh, Kelvin, Maxwell, Sommerfeld and Larmor.

5b. * Geometrical Optics. Properties of Systems of Rays, and their Various Aberrations. Hamilton's Characteristic Function or Eikonal. Applications to Optical Instruments.

6. Thermodynamics. Thermo- and Electro-Chemistry.

The establishment of the two laws of thermodynamics, and their application, by means of the methods of Gibbs and Helmholtz, to the examination of physical and chemical phenomena. Application to heat-engines, including steam, gas, and oil engines, the flow of gases and vapors, and the steam turbine. The conditions of chemical equilibrium, phenomena of electrolysis, osmotic pressure, and capillarity.

7. The Kinetic Theory of Gases. The Maxwell-Boltzmann Theorem and the Elements of Statistical Mechanics.

8. * The Theory of Radiation and of a Black Body.

The relations obtained from the laws of Kirchhoff, Stefan, Wien, and Planck, by the recent applications of thermodynamics.

9. * The Phenomena of Conduction of Electricity in Gases, and of Radioactivity, and their Bearing on the Structure of the Atom.

10. The Partial Differential Equations of Mathematical Physics.

Laplace's Equation, Equation of Thermal and Electrical Conduction, Equation of Wave-motion, Helmholtz's Equation, Lorenz-Beltrami Equation, Telegrapher's Equation, and their special cases; methods of

Cauchy, Green and Riemann-Volterra; Normal functions, Developments in Series, Fourier's Series, Legendre's, Laplace's, Bessel's and Lamé's functions.

This course is one of the most important for the physicist, and treats a great variety of subjects from the most varied fields, grouping them all into a connected system, and embracing all the methods of theoretical physics.

11.* The Elements of Integral and Integro-Differential Equations, and their application to Mathematical Physics.

12.* Selected Chapters in the Application of Theoretical Physics to Cosmical Phenomena, including Problems in Geodesy, the Tides, Meteorology, Seismology, and Terrestrial Magnetism.

13.* Linear Differential Equations.

The applications of the theory of functions to the linear differential equations of the second order which arise in mathematical physics.

14.* Orthogonal Surfaces and Curvilinear Coördinates and their Applications.

The courses for 1914-15 will be 1, 2, 3, 4, 4a.

In addition to the above formal courses there is held a weekly Colloquium, or meeting for the informal discussion of subjects not treated in the lectures, and for the presentation by the students of reports on important articles appearing in the journals. A part of the work of the colloquium consists in the systematic presentation of certain classical researches, more or less connected with the lectures, in preparing which the students make use of the original sources of information, thus gaining much acquaintance with the methods of the masters in research. The work of the colloquium has an excellent effect in training students to present their ideas in a systematic manner before an auditory.

Among the various lines of investigation now attracting the attention of physicists the following are preëminent in importance. First, the interrelations between the luminiferous ether and ordinary matter, and the modifications necessary to be made in Maxwell's theory in order to explain the known optical and electrical phenomena of bodies in motion, and that aspect of the theory which deals with the properties of the small electric bodies known as electrons. This portion of mathematical physics is extremely new, and has hardly begun to appear in university courses in this country. Second,

the structure of the atoms of matter, to which the subjects of spectroscopy and the new and fascinating field of radio-activity give the most promising clew. Third, the thermodynamics of radiation in general, which is most intimately connected with the first, and about which a similar remark may be made as to the lack of instruction.

Of branches of applied physics now awaiting the attention of the mathematical physicist may be mentioned meteorology, seismology, and geophysics in general, in all of which the accumulation of experimental data is ahead of the development of theory, to such an extent in meteorology that Professor Arthur Schuster has said that it would be advisable to suspend all meteorological observations for the next ten years, until the theory should have in some degree caught up with the mass of information already accumulated. The theory of meteorology depends on complicated applications of hydrodynamics and thermodynamics; so as to make great demands upon the mathematical physicist, but the field is a rich one to him possessed of the skill to cultivate it. The study of earthquake phenomena is one that is now becoming of great importance in this country, while the investigation of terrestrial magnetism has lately made great advances.

It is almost obvious to the trained investigator that no one can expect to become a physicist of the first rank without a thorough training in mathematical physics, as without that the results of experiment will never be collected into a coherent system worthy the name of an exact science. Furthermore all mathematical physics must rest upon mechanics, the principles of which are of an importance transcending that of any other branch of natural science. It is for this reason that the courses in physics in this department begin with mechanics, and are developed progressively in a systematic manner. They have the advantage of having been deliberately planned for the needs of students of pure physics, as experience has

shown them to be prepared by the various colleges, and of being all delivered by the same person, so that logical consistency and continuity of method are assured. The waste of time often incurred by repetitions of the same subject and of changes of notation by various instructors is thus totally avoided. Attention is called to the fact that no branch of physics is left unprovided for in the course of lectures.

The aim of the department is to insure in its students some acquaintance with all the various fields of experimental physics, to develop in them the power of exact measurement, to accustom them to exact reasoning from experiment to theory, and to encourage original research conducted on a sound basis. To this end students will be put to work in the laboratory upon experiments of sufficient difficulty to give them skill in measurements of precision, and to enable them to become familiar with the precautions and corrections necessary to be employed in exact work. After a sufficient amount of experience has been gained, and the student has shown himself to be possessed of sufficient originality to warrant independent investigation, he will be encouraged to take up for himself an original research in the hope of making a personal contribution to science. In this research he will have at all times the benefit of the direction and advice of the professor.

It should be urged upon intending students to prepare themselves, not only in ordinary laboratory measurements, but also in mathematics, the lack of proper mathematical preparation being a serious drawback to the appreciation of the lectures. In particular may be recommended for study not merely those portions of the calculus which deal with the working out of many indefinite integrals, etc., but the theoretical portions which deal with the ideas of partial derivatives, definite integrals, and their practical manipulation, together with enough analytic geometry to involve the properties of lines and *surfaces* of the second order, and a fair

amount of the elements of determinants. As suitable textbooks for preparation may be recommended to the student Lamb's, Osgood's or Gibson's Calculus, C. Smith's Analytical Geometries, and Muir's or Hanus's Determinants. Appell, *Eléments de l'analyse mathématique* may be very strongly recommended to the intending student for study before and during his course at the University.

It cannot be too strongly urged that the student should, from the beginning, be able to read French and German with ease and to make use of works in them.

REQUIREMENTS FOR THE DOCTOR'S DEGREE

1. The ability to read at sight specimens of scientific French and German, tested before the first of November preceding the Doctor's examination by a committee of two members of the Faculty.

2. The successful passing of an examination upon the general subject of Experimental Physics[1] and upon the subjects named above in the regular course in Theoretical Physics, as a major requirement, together with an examination in one minor subject, *to be determined in each particular case by the head of the Physical Department.* This subject will be Mathematics or Chemistry.

3. The presentation of a satisfactory dissertation, involving a substantial amount of original work, and forming a contribution of value to pure science. The presentation of the dissertation is a prequisite to examination. The time of residence necessary for the proper fulfilment of the above requirements will generally be at least three years, of which at least one will be very largely devoted to work on the dissertation. Students will not be encouraged to enter upon the work of a dissertation until they have acquired sufficient experience to enable them to specialize with advantage.

The aim of the department is to produce physicists rather than electricians, acousticians, opticians, engineers, or narrow specialists of any sort, for although in the nature of things one will be obliged to know more of one subject than of others, yet it seems evident that no thorough knowledge of any branch can be gained without a comprehensive view over the

[1] Every student is recommended to provide himself with Winkelmann's *Handbuch der Physik* as a work for continual reference.

whole subject. Without this the specialist, or the experimentalist lacking a knowledge of mathematics, will continually be falling into pitfalls which the more wary avoid. Furthermore it can be but a detriment to science to encourage research in new fields by immature and ill-prepared minds and hands.

The following statement is here inserted for the benefit of students of mathematics.

The minor in Mathematical Physics consists of the subject-matter of courses 1, 2, 3, and 10, which are intended to constitute the equivalent of five hours a week for one year. Course 10 is given in alternate years to the other courses. The subject-matter of the course is contained in Dr. Webster's treatise on *Dynamics* and his work on Partial Differential Equations, now in press.

THE LABORATORY

The laboratory occupies three floors of one wing of a large well lighted building free from disturbances, and admirably adapted to the purposes of a physical laboratory. On the ground floor is a room extending across the end of the building forty-five feet long by twenty-two feet wide, with windows on three sides, above which are three similar rooms. A lift running from the bottom to the top floor affords means of transporting apparatus, while its shaft furnishes space for manometer or barometer tubes. In the lower room are four piers with heavy stone tops, and two others below the floor on which can be placed heavy tables.

Also on the ground floor is a large dark room, partially below ground, in which the temperature is tolerably constant, containing a very large and heavy pier. The engine and storage-battery room contains a kerosene engine and dynamo on the same foundation and sixty storage cells of ten amperes capacity, constituting the power-supply. The engine may be started at a few moments notice, even at night, but has

been superseded for most purposes by a motor-generator which is driven by an external supply and furnishes all needed direct current. The storage cells are conveniently arranged so that each one is accessible from each side, from above and below, and the ventilation is excellent, while the room is as light and clean as the work-rooms. Distributing switchboards allow the current from the dynamo or any section of the battery to be supplied to any of the rooms. On the same floor are three rooms constituting the workshop, one of the most important parts of a research department of physics. The first room is devoted to wood-working and pattern-making, and accommodates also a bench for soldering. The next room contains the machinist's bench, two engine-lathes and planer, and the third room a Rivet precision bench-lathe, jeweller's lathe and drill-press. There is no countershafting in the building, each tool being driven by a separate electric motor, so that perfect quiet and steadiness are ensured. In the shop are executed all repairs and alterations of apparatus, and the new apparatus requiring continual experiment is constructed. Most of the principal pieces of apparatus belonging to this department have been thus constructed. In this manner, by having a mechanic always present, an extremely great economy in time and money is effected, and vexatious delays, which would otherwise completely arrest the progress of the work, are avoided. Facilities and encouragement are given to the students to construct apparatus for themselves.

On the main floor are the lecture room, the director's office, the large room used as the director's private laboratory and apparatus room, and three other convenient rooms for research. Two of these are arranged so that they may be darkened for photography, and are also fitted with chemical hoods. The large room on the top floor is diagonally di-

vided into two, one dark and devoted to the Rowland twenty-foot diffraction grating, and with a photographic dark room attached. Close by is a high potential battery of two thousand small storage cells. Every room in the laboratory contains sinks, gas and electric light connections, and several circuits connecting with the switchboard in the battery-room.

The laboratory is well equipped with apparatus for research, besides having the facilities above described for the construction of instruments of any sort needed for that purpose. In addition may be mentioned a large collection of diagrams illustrative of mathematical physics, many of them being originals of the figures in Professor Webster's "Electricity and Magnetism" and "Dynamics," and a number of interesting models used in teaching dynamics, thermodynamics, and electricity. Among them are Maxwell's Dynamical Top and a number of other interesting tops, Maxwell's and Rayleigh's induction models, Gibbs's, van der Waals's and other thermodynamical surfaces. This collection of drawings and models can probably not be matched in this country, and is continually being increased.

The laboratory affords so much space that it is rarely necessary to put more than one student in a single room. Every student receives personal attention in the laboratory from the professor whenever he needs it, and is continually in receipt of instruction and suggestion by personal contact, the best form in which information can be imparted. Emphasis should be laid on the advantage to the research student of the contact with a professor who has no other duties or interests than the furtherance of research, in an institution devoted to this as its main object.

THE LIBRARY

In the library Clark University has one of its strongest features. With a large separate building, administered in

the most liberal manner with a view to the advantage of the research student, and with ample funds for the purchase of books, its facilities in the Department of Physics can hardly be surpassed. It may be said to contain all of the most important works in many languages, and is continually kept up to date, any book wanted needing only to be mentioned to be procured. The library is particularly rich in journals, among which are included the transactions of the learned societies of England, France, Germany, Italy, Austria, Holland, and Belgium. Other sets are being continually added. A list of journals will be found on pages 50–55. There are few subjects connected with physics which may not be thoroughly studied in this library.

III. CHEMISTRY

Within the past few decades chemistry has been gradually passing from the larval state of a descriptive science into a higher state of development, the theoretical state. This transition has given to the ancient science, not only a new beauty and usefulness, but also an amazing *will to grow.*

Some liken the new chemistry to a tower in the earliest stages of construction, with a host of men swarming on the scaffolding, engaged in adding stone after stone to the promising structure.

From the pure science this intense constructive activity has spread, as might be expected, to the applied branches, notably the American chemical industries. Where twenty-five years ago the chemist was employed, and allowed, to do nothing but routine testing, to-day research laboratories are in active operation, whose members are expected to invent, develop, or improve something somewhere in the processes of manufacture. American enterprise has discovered a way toward the highest utilization of the country's wealth in setting trained ingenuity at work in chemical research laboratories.

The equipment of the industrial chemist, as well as of the competent teacher, must consequently consist, not so much in a memorized collection of formulae and processes, or of heterogeneous information in the chemistry of the manufactures, as in a clear critical understanding of the principles of pure chemical science and in some experience in grappling with difficulties. The desire for *such* knowledge, and the courage and perseverance necessary in attacking problems,

are acquired only through research. And hence *a department of chemistry, particularly a graduate department, must be primarily a department of chemical research.*

With this principle in view, the activities of all members of this Department, both instructors and students, are devoted mainly, almost entirely, to research. The number of lectures is reduced to a reasonable minimum. Students take up research from the first day of their residence in the Department, and are directed to devote about one-quarter of their time to all scholastic work combined, and the remaining three-quarters to research. The investigations in which they are expected to engage are, as a rule, extensive in scope and occupy two years at least, in some cases three years or more. This makes it possible for the student to found his Doctor's degree, not on a perfunctory dissertation, but on a study and contribution that will give him scientific confidence for years to come.

Even the lecture courses, instead of forming descriptive presentations of existing chemical knowledge, are conducted, as far as possible, on a research plan. In the first place, the material of the lectures is derived, not from text-books, but from the original literature, and the student is constantly referred to original communications for accessory study. Then, each topic is approached by the lecturer, not as a chapter in a book, but as a problem in nature. The topic is introduced by an estimate of its importance and of its bearing on other problems. This is followed by an account, on the historical plan as far as possible, of the extent to which the problem has been solved, of how this was done, and of how much is not yet solved, with suggestions as to practical methods by which solution might be obtained. It is believed that such *critical mode* of study is the true characteristic of university work; perhaps the only characteristic that can keep university lectures from forming a continuance

of the teaching of the lower schools, which often permanently impairs the student's most precious possession: his inherited creative instinct.

Specialized courses will be offered, when needed, on topics of history of chemistry, chemical dynamics, heterogeneous equilibria, stereo-chemistry and other special chapters of organic chemistry, electro- and thermo-chemistry, applications of thermodynamics to chemistry, etc., and the student will be expected to attend them regularly. Students not quite prepared for work of this kind will have an opportunity of taking collegiate courses in chemistry and allied subjects, in Clark College.

Part of the scholastic work of the Department consists in Colloquium exercises, students and instructors alike presenting accounts of current chemical research or, at times, delivering formal lectures on classical achievements of the past, or on the life and life-work of celebrated masters of chemical research.

Finally, several times in course of the academic year lectures will be delivered here by active chemical investigators from other institutions—lectures dealing generally with the aims and methods of their own investigations. The Department expects much stimulus from such occasional contact with brilliant and hopeful scientific men.

The research work conducted in the Department runs mainly along the following lines: 1. Experimental and theoretical study of the deviations of fact from accepted principles of *general chemistry;* 2. Experimental study of organic substances and reactions from the standpoint of chemical statics and dynamics: *physico-organic chemistry.* Of course, promising investigations may be taken up, from time to time, along other lines as well.

Instead of more or less insignificant pieces of work being "assigned" to students for their first experience in research,

they will be made, *if they desire it*, collaborators of their professor in his own investigations (unless, indeed, they bring forward practicable research projects of their own). Nothing could more certainly assure constant and intimate contact between professor and student and the student's really receiving the best that the Department can offer: individual guidance.

REQUIREMENTS FOR THE DOCTOR'S DEGREE

Strictly speaking, there are no formal "requirements" for the Doctor's degree in this Department. The general University Faculty expects in all cases one year's residence. Otherwise the Department is autonomous in its organization of the training for the degree and in its final estimate of the candidate's maturity. *This imposes upon both instructors and students the duty of zealously guarding the honor of the degree and of maintaining in the Department the highest attainable intellectual standard.*

The time necessary to qualify for the degree of Doctor of Philosophy will depend in each case partly upon the ability of the student, but mainly upon the exigencies of his investigation. Three years will not be too long in most cases.

If the student does not possess, at the time of his joining the Department, a good reading knowledge of both German and French and a working knowledge of analytical geometry and the calculus, he ought to acquire such knowledge as early as possible. Experience shows that students learn a considerable amount of mathematics through the special course in chemical mathematics offered here, and also through the courses in physical chemistry. The Colloquium work invariably leads to improvement of the student's knowledge of languages.

The student is advised and expected not to neglect any

one of the great branches of modern chemistry by "majoring" in one of them and "merely minoring" in the others.

The examinations for the degree will consist, on the one hand, in a series of partial tests distributed throughout the candidate's period of residence and, on the other hand, in a general final examination in the several branches of chemical science, including organic and physical chemistry, and chemical statics and dynamics; also in one minor subject *to be determined in each case by the Head of the Chemical Department.*

But the real basis upon which the degree will be conferred will be a dissertation forming, in the opinion of the Head of the Department, a genuine contribution, either purely theoretical or experimental, to chemical science.

If a candidate shall have shown in his research signs of true originality of thought, the Doctor's degree will be conferred upon him *cum laude.*

THE MASTER'S DEGREE

The University does not require an original scientific contribution in connection with the Master's degree. In this Department an applicant is, accordingly, offered free choice between founding his degree on research or on purely scholastic work. It is a pleasure to record that as yet applicants have invariably chosen the former, in spite of being warned that research is uncertain of outcome and more difficult, and might prolong to two years the time necessary for the attainment of the degree.

In the scholastic exercises no qualitative distinction is made between work for the Master's and that for the Doctor's degree in chemistry. The former degree is considered a stepping-stone to the latter, and the subject-matter of the Master's dissertation is accepted as part of the scientific contribution on which the Doctor's degree is to be based.

1. Chemical Dynamics: A critical study of the law of mass action. Mondays and Fridays, first half of the year. Dr. Rosanoff.

2. Heterogeneous Equilibria: A critical study of the phase rule. Mondays and Fridays, second half of the year. Dr. Rosanoff.

3. The Terpene Bodies, Monocyclic and Polycyclic: A detailed account of synthetic and structural knowledge in this recent chapter of organic chemistry. Wednesdays, throughout the year. Dr. Rosanoff.

4. Special Topics of Organic Chemical Research, lectures and colloquium, Fridays, from 3 to 5 p. m. throughout the year. Dr. Norris.

5. General Colloquium, Tuesdays, at 4 p.m. Once in two weeks. Dr. Rosanoff.

ONE CANDIDATE'S EQUIPMENT

In order to give anyone who may be interested some insight into the actual working and results of the arrangements made in the Department, it seemed desirable to make a statement as to the work here of one student, now graduated:

I. Research

The candidate began his research, dealing with the cause of the relative velocities of certain organic reactions, in October, 1908, and continued the study until August, 1911. The work consisted in precise measurements of reaction velocities, combined with other physico-chemical measurements and preparative organic work. It gave the candidate no little insight into the methods of chemical kinetics and statics.

II. Courses Taken

First Year:

1. The hydro-aromatic series, including the monocyclic and polycyclic terpene bodies (Dr. Rosanoff).
2. Organic stereo-chemistry (Dr. Rosanoff).
3. Special methods of inorganic analysis.
4. Organic synthesis (Dr. Rosanoff).
5. Chemical mathematics (Dr. Story).

Second Year:

6. General and physical chemistry, especially gases, liquids, and solutions (Dr. Rosanoff).

7. Dyestuffs, alkaloids, and polypeptides.

8. Inorganic stereo-chemistry; radio-activity.

9. Thermodynamics, with some emphasis on applications to chemistry (Dr. Webster).

10. Supplementary and explanatory course in thermodynamics (Dr. Hubbard).

During his second year the candidate also acted as teaching assistant in organic synthesis in the Collegiate Department (one afternoon a week).

Third Year:

11. The law of mass action in homogeneous systems (Dr. Rosanoff).

12. The phase rule and the law of mass action in heterogeneous systems (Dr. Rosanoff).

13. Constitution of derivatives of benzene, naphthalene, anthracene, etc.

14. Methods of atomic weight determinations.

During the third year the candidate also attended for the second time Dr. Rosanoff's lectures on organic stereo-chemistry and spent a small fraction of his time as Research Assistant in the University Department.

III. Partial List of Papers Reported by the Candidate in Colloquium

1. Jean Rey. "The Increase in Weight of Tin and Lead on Calcination." (Alembic Club Reprints.)

2. Mayow. "Medico-Physical Works." (Alembic Club Reprints.)

3. Priestley. "The Discovery of Oxygen." (Alembic Club Reprints.)

4. Scheele. "The Discovery of Oxygen." (Alembic Club Reprints.)

5. Ipatieff (pyrogenetic researches), *Berichte*, *34*, 596 (1901).

6. Ipatieff (same subject), ibid., 3579 (1901).

7. Ipatieff (same subject), ibid. *35*, 1047 (1902).

8. Perkin and Pickles (synthesis of terpenes), Trans. London Chem. Soc., *87*, 639 (1905).

9. Perkin and Matsubara (same subject), ibid., *87*, 661 (1905).

10. Baeyer (terpenones of the carvone group), *Berichte*, *27*, 1916 (1894).

11. A. A. Noyes (conductivities at high temperatures), J. Am. Chem. Soc., *30*, 335 (1908).

12. A. A. Noyes (conductivity and ionization of polyionic salts), J. Am. Chem. Soc., *31*, 987 (1909).

13. Bredig (osmotic pressure and the Van der Waals equation), *Zeit. physik. Chem.*, *4*, 444 (1899).

14. A. A. Noyes (same subject), ibid., *5*, 53 (1890).

15. Abegg (same subject), ibid., *15*, 254 (1894).

16. Freund, Martin, and Achenbach (action of hydroxylamine on certain derivatives of anthraquinone), *Berichte*, *43*, 3251 (1910).

17. Rabe (on a peculiar connection between the strength and action of acids), ibid., *43*, 3308 (1910).

18. Lecture on the manufacture of essential oils (based largely on Muspratt).

19. Lecture on the Grignard reaction.

20. Account of the life of Lord Kelvin.

21. Account of the life and work of Van't Hoff.

22. Lecture on the results of the candidate's own research.

FACILITIES

The University chemical laboratories occupy a considerable part of the laboratory building. The storerooms contain an unusually large collection of organic preparations, besides all the ordinary inorganic chemicals. The collection of physico-chemical apparatus, including the latest form of Pulfrich's refractometer, an excellent Schmidt and Haensch polariscope, a large Hilger quartz spectrograph, a Burkhardt calculating machine, an Altschul apparatus for measuring critical pressures, specially constructed large constant-temperature stillheads, a set of excellent thermostats, sets of fine thermometers, etc., is sufficient for most ordinary purposes. Whatever special apparatus and chemicals are needed in connection with the work of research are ordered at once, every reasonable effort being made to help the student obtain a maximum of results with a minimum expenditure of time and energy. In this connection it may be mentioned that the Department is at liberty to use the

services of the skilled mechanician regularly employed by the Department of Physics. Students will themselves prepare their chemicals, or build their research apparatus, only in those cases in which the Director may consider such work especially instructive to them.

The Director of this Laboratory is Secretary of the Association of American Chemical Research Laboratories, formed at the second decennial celebration of Clark University in 1909. *Inventories of the more important research laboratories are kept here, and any chemical needed in an investigation, if not in our own stock, is promptly supplied by some other member of the Association.* Such exchange of chemicals by laboratories entitled to duty-free importation has recently been declared by the authorities at Washington to be perfectly legal. On a number of occasions in the past it has been of the greatest help to members of this Department.

THE LIBRARY

The Library of Clark University has, independently of the other departments, a magnificent endowment of its own. Its chemical collection contains complete files of all the more important journals in English, German, and French, and a rapidly increasing number of general treatises, monographs, and reference works. The income of the library permits of purchasing at once *all* books needed by anyone engaged here in chemical research.

Part of the collection, including the files of the *Zeitschrift für physikalische Chemie*, the *Berichte der deutschen chemischen Gesellschaft*, the *Transactions of the Chemical Society of London*, the *Journal of the American Chemical Society*, the *Chemisches Zentralblatt*, and a number of reference works, forming a small departmental library proper, is kept in one of the laboratory rooms and is accessible to all members of

the Department at all times. The departmental library, for the establishment of which the Department is deeply indebted to Dr. Louis N. Wilson, University Librarian, is one of the most valuable aids in the work of both instructors and students. It will be gradually enlarged.

SCHOLARSHIPS AND FELLOWSHIPS

The Department has at its disposal several Scholarships and Fellowships, which will be awarded each year to the ablest and best recommended applicants. Scholars, and especially Fellows, will coöperate with the Director in maintaining a harmonious and scientific atmosphere in the Department and in promoting all the ends of the University. They will have no duties besides that of making the best use of the facilities for study and research offered to them.

RESEARCHES CARRIED ON IN THE DEPARTMENT SINCE THE INSTALLATION OF ITS PRESENT HEAD, SEPTEMBER, 1907

1. Practical elaboration of a new method for determining the partial vapor pressures of organic mixtures, and determination by means of it of the vapor pressures of a number of typical binary mixtures (published; *crowned by the American Chemical Society with the Nichols gold medal of its New York Section*).

2. A quantitative study of the Victor Meyer Esterification Law and the Steric Hindrance hypothesis (published).

3. A quantitative study of steric hindrances in the esterification of fatty acids (published).

4. Perfection of a precise and rapid method for determining halogens in organic compounds (published).

5. A study of the transformation of aldohexoses into alcohol by ferments, enzymes, and alkalies (uncompleted).

6. A new relationship between the vapor pressures of binary mixtures and a general quantitative theory of fractional distillation (partly published).

7. Experimental study of fractional distillation in the light of the results of the preceding research (ready for publication).

8. A theoretical study of the variation of the vapor composition of binary mixtures with the temperature (ready for publication).

9. A study of the mechanism of iodination in the aromatic series by halogen carriers (uncompleted).

10. A new study of steric hindrances in esterification (ready for publication).

11. A precise quantitative study of the phenomena of direct esterification and ester hydrolysis (ready for publication).

12. A study of the kinetics of certain inorganic reactions (temporarily interrupted).

13. A precise study of the decomposition of tertiary amyl esters (one part ready for publication).

14. A peculiar transformation of benzo-bromamide (temporarily interrupted).

15. An improved method for the preparation of acetamide (published).

16. Definition of an Ideal Gas (in collaboration with Professor Webster; published).

17. A new study of the Duhem-Margules equation (in collaboration with Professor Story; interrupted).

18. A theoretical revision of some of the principles of the theory of solutions (in progress).

19. A new study of the dynamics of sugar inversion (in progress, two parts published).

20. A rapid method for measuring partial vapor pressures (partly published).

21. Limitations of the constant-temperature stillhead (ready for publication).

22. A study of esterification equilibrium in the gaseous state (temporarily interrupted).

23. An improvement of the preparation of para-nitro-phenol (published).

24. Determination of the relative strengths of organic acids (temporarily interrupted).

25. The working of the constant-temperature stillhead in the case of mixtures with maxima or minima in the boiling-point curves (ready for publication).

26. A new lamp, giving an exceedingly intense monochromatic light (ready for publication).

27. A study of certain reactions and derivatives of fumaric acid (published).

28. A rapid method of analyzing ternary mixtures of toluene, ethylene bromide, and carbon tetrachloride (published).

29. A method of determining the molecular boiling-point elevation of solvents (ready for publication).

30. A study of the influence of solvents on the specific rotatory power of substances (in progress).

31. A theory of homogeneous catalysis (published).

IV. BIOLOGY

The work of the biological department has reference chiefly to the problems of general physiology, *i.e.*, problems dealing with or bearing upon the peculiarities of vital processes as such. In modern physiology living organisms are regarded as material systems having special and highly distinctive characteristics which are subject to analysis by the methods of the exact sciences. The problems presented by the living cell—a system consisting largely of colloidal material and distinguished by the possession of metabolism and other unique peculiarities—are most effectively approached from this point of view, and fundamental progress in general physiology has been due chiefly to the application of the sciences of physics, chemistry and physical chemistry to the analysis of the vital processes. The biological department offers instruction and facilities to those interested in the application of the physical and chemical sciences to the problems of general physiology. Students and investigators in this field will find unusually good opportunities for gaining the requisite knowledge of physics, chemistry and especially physical chemistry, and every effort will be made to correlate their work in these departments with their physiological work. Students of the physiological analysis of the reactions and behavior of normal intact organisms are offered the further advantage of coöperation with the department of psychology. Work in the physiology of development, comparative physiology, general pharmacology and other fields of research in which marine animals are especially valuable may be conducted during the summer at the marine Biological Laboratory at Woods Hole under

the direction of Professor Lillie, and credit for work done at Woods Hole will be given in Clark University.

The laboratory is equipped with the usual apparatus and materials for work in general physiology. Any additional apparatus, animals or chemical reagents required for the purposes of any special research will be provided wherever possible. The conditions are especially favorable with regard to scientific literature. Complete files of nearly all of the important journals in zoölogy, physiology and biological chemistry are in the library, as well as a large number of special works in these sciences, and literature in other biological fields (botany, medicine) can be procured on short notice.

For admission to the laboratory students should have had adequate previous training in biology, chemistry and physics. Resident students whose preparation in these subjects is insufficient may remove these deficiencies by taking the courses offered in Clark College. Students desiring to attend lecture courses without taking laboratory work can make special arrangements to do so.

The following courses are offered:

1. Fundamental Problems of General Physiology. This course is introductory and will deal chiefly with the physiology of the living cell from a physico-chemical point of view. The subject matter will be divided somewhat as follows: The distinctive characteristics of living as distinguished from non-living matter; the physico-chemical constitution of the cell; the nature and significance of cell-organization; the importance of the colloidal state in physiological processes; the rôle of electrolytes; the physiology of stimulation, contractility, and related processes; the general reactions and elementary behavior of intact organisms (tropisms, etc.); the general characteristics of metabolic processes (oxidations, syntheses, interchange with surroundings); cell-reproduction, fertilization, development and heredity. Dr. Lillie, *two lectures weekly, October to June.* Students with sufficient preparation will be assigned laboratory work in connection with these topics.

2. Special Problems of General Physiology. A more advanced course of lectures will be given on topics of general physiology, having

especial reference to the problems under investigation in the laboratory. Hours will be arranged to suit requirements. Dr. Lillie, *October to June.*

3. Biological Seminar. The Seminar will meet once a week to present results of research and to review and discuss recent literature. *October to May.*

4. Special Topics in Biological Chemistry. The aim of this course is to present in greater detail than is usually possible in a more general course, certain subjects of particular interest to students intending to undertake biochemical research. The subject at present offered is the biochemistry of the fats. The discussions will include the physical and chemical properties of the fats, their metabolism, and general physiological significance. Dr. White. *One lecture weekly, February to June, 1914.*

V. ANTHROPOLOGY

DR. CHAMBERLAIN will lecture twice a week throughout the year. The courses offered endeavor to cover the following field:

GENERAL ANTHROPOLOGY, embracing: (a) History, scope and relations of the science. (b) PHYSICAL ANTHROPOLOGY; problems, investigations, results, laboratory work. (c) ETHNOGRAPHY; races and race-origins. (d) ETHNOLOGY, INCLUDING SOCIOLOGY; origins and development of the arts and sciences, institutions, ideas and ideals of man and the races of man, human civilizations, their origin and development. (e) MYTHOLOGY; folk-lore, religions. (f) LINGUISTICS; race and language, origin and development of language and of languages, psychology of language, gesture-speech and written language, comparative linguistics, comparative literature. (g) CRIMINAL AND PATHOLOGICAL ANTHROPOLOGY; physical and mental; ethnic morals. (h) HISTORICAL AND ARCHEOLOGICAL; primitive man and primitive culture, the precursors of man.

SPECIAL ANTHROPOLOGICAL TOPICS most akin to Psychology and Pedagogy, embodying the results of the most recent and important studies and investigations of the following and other subjects, particularly: The Characteristics in the Primitive Races and their Rôle in Human History; The Physical Anthropology of Infancy, Childhood, Youth, Manhood, Old Age; the Anthropological Phenomena of Growth, Arrested Development, Degeneration; Anthropological Aspects of Heredity and Environment in the Individual and in the Race; Uncivilized Races and Civilized Races; the Phenomena of Race-Mixture; the Evolution Problems of Humanity; Education among Primitive Peoples; the Anthropological History of America; the Interpretation of Folk-Lore; the Psychology of Primitive Peoples; the Trend of Human Progress; the Psychology of Primitive Languages; the Mind of Primitive Man and its Expressions; the Development of Human Personality; the Rôle of the Individual in Primitive Culture; Progress and its Criteria; the Orient and the Occident in their Relations to Human Evolution; the Negro in Africa and in Amer-

ica; the American Indian; the Anthropology of Japan and China; "World Languages" and "World Culture;" Anthropological Aspects of Eugenics, etc.

The lectures in Anthropology will have special bearing upon the courses in Psychology and Pedagogy in the University, and every effort will be made to utilize the latest results of Anthropological investigations.

From time to time, the most valuable current literature will be reviewed and students made acquainted with the best contributions to Anthropological Science in the various foreign languages. An annotated Bibliography of the "Periodical Literature" of Anthropology, by Dr. Chamberlain, is published quarterly in *Current Anthropological Literature*. Reference may be made also to the article on "North American Indians," in the new (eleventh) edition of the *Encyclopedia Britannica* for orientation concerning one of the primitive races of man. The importance of a thorough acquaintance with the bibliography of their subjects is impressed upon all students, and all possible assistance in this direction is always at their disposal.

VI. PSYCHOLOGY

A complete course in Psychology at Clark University includes the following subjects:

1. Anatomy and Physiology of the Brain and Spinal Cord, sense organs, and other parts of the body, especially the muscles—the organs of the will—in so far as they are concerned with mental processes—together with a good general background of biology. For this a special laboratory is equipped.

2. Physiological and Experimental Psychology, including an outline of the anatomy and physiology of the central nervous system and sense-organs; the elementary sense-experiences; sensation and perception; the measurement of sensational intensity; space; time; reaction-times; affection and emotion; memory; association; attention; apperception; will; the "higher mental processes;" inter-relation of mind and body. For this a special laboratory is equipped.

3. Comparative and Genetic Psychology. Review of the general doctrine of evolution as a basis for the evolution of mind. Discussion of experimental and observational studies upon typical forms of animal life, beginning with the protozoa. Instincts; animal and human infancy. Childhood and adolescence.

4. Abnormal and Morbid Psychology, as nature's experiments, *e. g.*, border-line phenomena as seen in neurotic subjects, prodigies, and geniuses; defectives, such as the blind, deaf, criminal, idiotic; mental and nervous diseases, epilepsy, phobias, neurasthenia, hysteria; morbid modifications of will, personality and emotion, etc. Special clinical facilities for this work are open to the department in the hospitals and other institutions of the city.

5. Anthropological Psychology; myths, customs and belief, comparative religion and psychology of religion, primitive art, and the study of the life of savages and children; adolescence and senescence; physical measurements illustrating laws of growth in size and power, etc.

6. Æsthetics and Ethics, the psychology of music, painting, literature, the phenomena and laws of volition and morality.

7. History of Psychology and Philosophy, including the chief culture institutions, science, medical theories, Christianity, and education generally.

8. Applications of Psychology, Pedagogy, including mental and moral hygiene and regimen, school organization and methods from kindergarten to university; the sex problem; defectives, etc.

9. The Psychology of Sex; lessons from the aberrations of this instinct; some of its normal phenomena; the current theories; psychic differences between men and women; education of girls; fatherhood, motherhood; instruction of the young in matters pertaining to sex; theories of Freud, Moll, Ellis, etc.

10. The Psychology of Border-Line Phenomena, including spiritism, telepathy, hypnotism, dreams, multiple personality, somnambulism, crystal gazing, dousing, mind reading, sleight of hand performances, major symptoms of hysteria, psychotherapeutics and mind cure, methods of psychological analysis, etc.

The aim of the Psychological Department is to cover this field as well as its instructors are able to do so in two or three years.

The following courses are announced for the academic year 1914–1915.

DR. HALL'S COURSES

Dr. Hall expects to give the following courses next year, although variations from this programme may be made if there is reason to believe that the greatest good of the greatest number of students will be thereby promoted:

1. The Psychology of the Feelings and Emotions. This course will involve a brief sketch of the history of the theories in this field and a much more extended account of the recent experimental, clinical and genetic work done in this department. The purpose of the course is to give a clear account of the present condition of our knowledge of each of the feelings, one after another, pleasure and pain, fear, anger, sympathy, jealousy, love, hate, etc.

2. Psychogenesis. This course will begin with an account of the theories of the origin both of life and of mind, with chief emphasis upon the latter. There will be a survey of the results of experimental biology,

concerning elemental life or substances that resemble it, then experiments and observations upon the simplest organisms. This will be followed by a résumé of our knowledge of certain typical forms of animal instinct up the series, and upon this basis the contributions to paleontology will be drawn upon and certain lessons as to the development of the instinct of type forms of life; the horse, camel, monkey and other typical forms will be dwelt upon at some length. This will be followed by a brief account of culture stages of the human race from the paleolithic age and that of the troglodytes up.

3. The Unconscious or the Subconscious. This course will begin with a brief outline of the theory of consciousness and unconsciousness and the place of each and their relations, and will then pass to the subjects to be chiefly considered, viz., dreams and their recent studies; hysterical phenomena; the teachings of Janet, Freud, Jung; psychoanalysis; individual psychology, particularly that of temperament and character.

4. The Psychology of Appetite, Foods and Nutrition.

5. Some Vital Problems in Education. This course will be given Saturdays for teachers and the special field it covers will be announced later.

6. The Seminary, at Dr. Hall's house, three hours every Monday evening through the year.

7. Researches with individuals on special topics.

EXPERIMENTAL PSYCHOLOGY

The primary purpose of this department is to train students for the investigation of psychological problems. The lecture courses and the Journal Club aim to familiarize the student with the history and the present status of psychological experimentation; the laboratory courses are arranged with a view to training him in experimental procedure, and equipping him for independent research.

LABORATORY

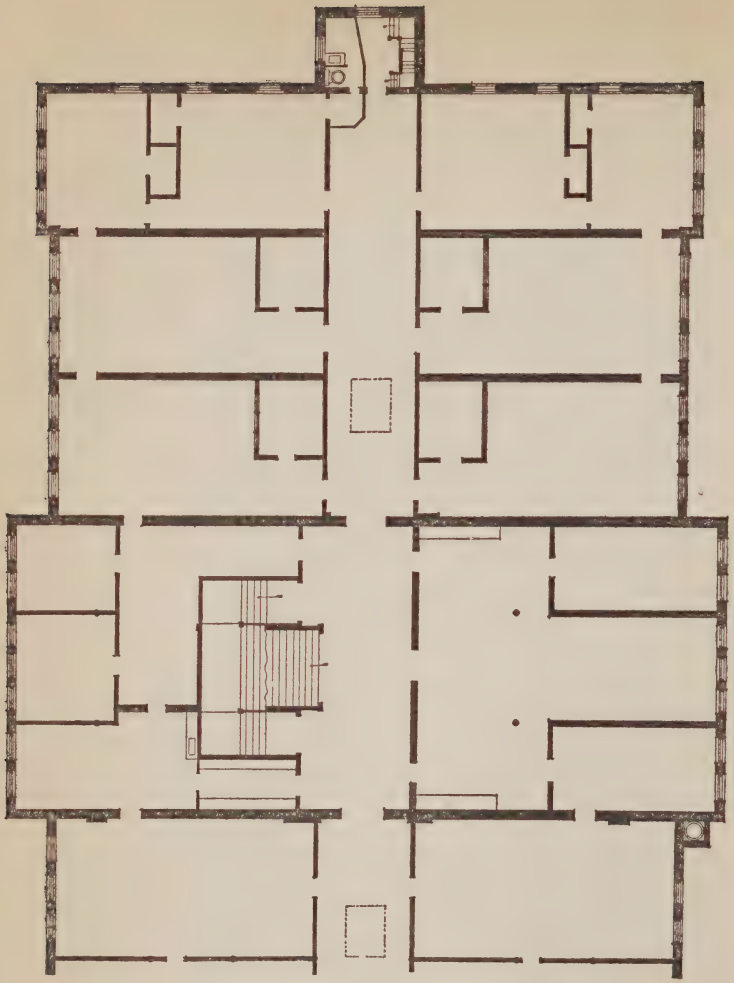
The psychological laboratory occupies a suite of twenty rooms on the upper floor of the main building of the university. These rooms, as at present arranged, are devoted to the follow-

ing purposes: office, lecture-room, seminary and reading-room, dark-room, work-shop, general apparatus-room, and a group of rooms for research.

The laboratory is well equipped with general apparatus; and it has an annual appropriation sufficient to provide for the purchase and manufacture of such apparatus as is required from time to time for special investigations. The work-shop contains power- and other lathes, a power-drill, and an abundant equipment of tools and materials for the manufacture and repair of apparatus. The services of an expert mechanician are available; and every facility is provided for the devising and constructing of apparatus appropriate for the solution of such special problems as are undertaken.

The library contains an unusually large collection of psychological literature. It is especially well supplied with scientific periodicals and proceedings of learned societies. Since the enrolment of the department consists exclusively of graduate students, and is, therefore, relatively limited in numbers, it is possible to give to each student of the department a maximum of freedom in the use of the library. Besides having access to the university library, students of the laboratory have at their disposal an excellent working-library of psychological books and periodicals which are shelved in the seminary-room.

The more general and fundamental courses of lectures in the department are repeated each year, while the more advanced and specialized courses are given only in alternate years. A feature of the method of instruction at Clark University is the frequent informal conferences between instructor and student. The Journal Club meets weekly (two-hour sessions) for the discussion of the current literature. The more valuable contributions presented by the members of the Club will be published in the *American Journal of Psychology*. The laboratory work includes an introductory



PSYCHOLOGICAL LABORATORY

and a research course. The former is designed to familiarize the student with the efficient handling of apparatus, and to acquaint him with the methods to be followed and the precautions to be observed in psychological experimentation. This course is repeated each year; it, or its equivalent, is a prerequisite to all other work in the laboratory. The research varies from year to year.

Provision for Comparative Psychology is now made at the Hadwen Arboretum, about fifteen minutes' walk from the main building of the University, where special facilities for the care of the animals have been provided.

DR. BAIRD'S AND DR. FERNBERGER'S COURSES

1. General Psychology. A course of lectures and demonstrations dealing with sensation, affection, attention, volition and perception. This course will present, in concrete and systematic form, the more important facts that have been yielded by the experimental investigation of the simpler mental processes, together with a discussion of theories that have been advanced from time to time. Dr. Fernberger. *Two hours a week. First semester.*

2. The Application of Statistical Methods to Psychology. A course of lectures and demonstrations in which will be considered the calculations necessary for the practise of the psychophysical methods and also the relation between the methods. The distribution of relative frequencies, correlation and similar topics will also be considered. Dr. Fernberger. *One hour a week. Second semester.*

3. The Psychology of Language. A course of lectures dealing with an analysis of the language function, with special reference to the study of the aphasias. In this course will also be considered the anatomical basis of language, the origin of language ontogenetically and phylogenetically considered, as well as such special topics as the psychology of reading. Dr. Fernberger. *One hour a week. Second Semester.*

4. The Psychology of Memory, Imagination and the Process of Learning. Lectures and demonstrations dealing with the phenomena of mental acquisition and retention; imagery, association and reproduction, the phenomena of learning and forgetting, the function and development of habits. Dr. Baird. *Two hours a week. Second semester.*

5. The Psychology of the Higher Intellectual Processes. The psychology of meaning, abstraction, thought, judgment, reasoning; the function and significance of imagery; the phenomena of *Bewusstheit, Bewusstseinslage, Aufgabe, Einstellung* and *determinierende Tendenz.* Dr. Baird. *One hour a week.*

6. Psychological Systems. A statement and discussion of the characteristic features of the systematic doctrines embodied in the writings of representative psychologists, past and present. Dr. Baird. *One hour a week.*

7. German Translation. A course for the rapid reading of a German psychological text. Dr. Baird. *One hour a week.*

8. Comparative Psychology. A description and discussion of investigations of animal learning. Dr. Baird. *One hour a week.*

9. Journal Club. A seminary for the informal discussion of current psychological literature. Meetings are held weekly throughout the year.

10. Introductory Experimental Course. In this course the student will perform a series of standard psychological experiments, chiefly for the purpose of mastering the technique of experimentation. The course will be given by Dr. Baird, Dr. Fernberger and Mr. Wheeler. *Four to six hours a week, throughout the year.*

11. Research Course. Under this title are grouped the special investigations undertaken by students in the laboratory. *Topics and hours to be arranged.*

Dr. Tsanoff's announcement of courses

1. History of Modern Philosophy. A lecture-course dealing with the main currents of philosophical thought since the Renaissance and the dominant tendencies and problems of present-day philosophy. *One hour a week.* (Omitted in 1913–1914.)

2. Ancient and Mediaeval Philosophy. An historical outline, with reports and discussions of special problems; specially intended as a general review for students wishing to deal in greater detail with particular periods of Greek and scholastic philosophy. *One hour a week.* (Omitted in 1913–1914.)

3. Post-Kantian Philosophy. A somewhat technical study is attempted of the development of German philosophy during the nineteenth century; special emphasis is laid on the rôle played by the Critical philosophy in the evolution of the modern idealistic conception of Experience. *One hour a week.* (Omitted in 1913–1914.)

4. Modern Theories of Ethics. A lecture-course dealing with the development of ethical theory since the Renaissance: Cartesian, later rationalistic and English utilitarian theories of morals, the ethics of German idealism, and the influence of the theory of evolution on contemporary ethics. *One hour a week.*

5. The Philosophy of Will: Freedom, and Determinism. A seminary for the critical study of the freewill controversy in the history of philosophy, ancient and modern. *One hour or more a week.*

The following courses offered by Professor James P. Porter in Clark College are open to students in the University:

1. General Psychology. Three hours a week, throughout the year.

2. Social Psychology. Three hours a week, throughout the year.

3 a. The Evolution of Mind and Genetic Psychology. Three hours, second semester.

3 b. Educational Psychology. Three hours, first semester.

4. Laboratory Course in Experimental Psychology. Three hours a week, throughout the year.

At the Hadwen Arboretum, where a "station for the study of animal behavior" has been established and is now under Dr. Porter's direction, are found facilities for the study of certain forms of animal life; and here too will be found some of the illustrative material for his lectures.

Psychiatry

Dr. Cowles, lecturer on Psychiatry, former head of the McLean Hospital at Waverley, Mass., will give a course at the University and the Worcester State Hospital for the Insane. Dr. Cowles's course includes the following topics with clinical demonstrations.

The Melancholia-Mania Group of Neuropsychoses:

1–2. The dependence of Psychiatry upon Mental and General Physiology; the concept of energy fundamental; the reflex arc and integra-

tive action of the nervous system. Relation of inhibition to anabolism, to external function and katabolism.

3. Conduction-paths and Threshold Values: changes in physiological conditions in relation to the determination of psychical effects—normal habit—overuse and disuse—mental symptoms.

4. The Physiology and Pathology of Emotion; depression and exaltation figurative expressions in psychology, both being excitative and katabolic; relations of feeling-tone to conditions of ill-being.

5. Psychasthenia and Neurasthenia; the minor psychoneuroses—psychological automatism, fixed ideas, hysteria.

6. Mental Symptoms of Nervous Exhaustion; their genesis in reductions of functional capacity of the nervous and mental mechanism.

THE DETERIORATING PSYCHOSES:

7–10. Dementia praecox, general paresis, senile dementia. Involution psychoses, paranoia.

Dr. Cowles's lectures are open without fee:

(1) To all members of the Faculty of the University and College;
(2) To all members of the Psychological Department, and to members of the College who are taking other psychological courses in the University.

The fee for all other persons is $10.00.

VII. PEDAGOGY

This department offers a course which can be taken for the degree of Doctor of Philosophy. Its work is in the closest connection with that of psychology and anthropology, and in part based on these subjects. The work in this department is intended to meet the needs of the following classes of students.

First. Those intending to teach some other specialty but who wish a general survey of the history, present state, methods, and recent advances in the field of university, professional and technical education.

Second. Those who desire to become professors of pedagogy, or heads or instructors in normal schools, superintendents, or otherwise to become experts in the work of education.

The programme of the Pedagogical Department includes courses upon the following subjects:

1. (*a*) Child Study. (*b*) Pedagogical Psychology. (*c*) Experimental Pedagogy. (*d*) School Hygiene.

2. (*a*) Principles of Education. (*b*) History of Education and Reforms. (*c*) Methods, Devices, Apparatus, etc.

3. (*a*) Organization of Schools in Different Countries. (*b*) Problems of College Education. (*c*) The Teaching Profession. (*d*) Motor Education, including manual training, physical education, etc. (*e*) Moral and Religious Education. (*f*) Ideals.

The courses in pedagogy for 1914–1915 will be as follows:

DR. WILLIAM H. BURNHAM'S COURSES

A. The Hygiene of Instruction. The conditions of brain activity. The principles of mental hygiene. The laws of nervous activity and the learning process in relation to problems of instruction. Fatigue.

The period of study. The hygiene of the kindergarten. The hygiene of spelling, reading, writing, arithmetic, manual training, physical training, etc. The hygienic aspects of grading, of examinations, of discipline, of punishment, etc. *One hour a week, throughout the year.*

B. The Teaching Profession. The essential characteristics of a learned profession. The teacher and the parent. The teacher and the artisan. The teacher in ancient civilization; in China, India, Greece, Rome, etc. The medieval teacher. The teacher of the early Renaissance. The Reformation. The great modern schoolmasters, Sturm, Comenius, F. A. Wolf, Pestalozzi, *et al.* The teaching profession in Germany. The function of the teacher in social evolution. The function of the teacher in the schoolroom. Characteristics of the teaching profession as a social group. Fundamental principles concerning the training of teachers. Different plans tried in this and other countries, especially in the training of secondary teachers. The hygiene of teaching. *Once a week, throughout the year.*

C. Seminary. The work will be determined in part by the needs of the students who elect this course. It will probably be devoted chiefly to the history of education or to experimental pedagogy. It is hoped also, that each student will select, after consultation with President Hall and Dr. Burnham, a topic for special investigation. The results of such studies may be published. *One or two hours a week, throughout the year.*

President G. Stanley Hall's Course

Some Vital Problems in Education. See special circular later.

Dr. Edmund C. Sanford's Course

The Problems of College Education. A discussion of the most important questions of college efficiency with especial reference to present day tendencies and criticisms. *One hour a week throughout the year.*

Dr. Capen's Course

During the past year Dr. Samuel P. Capen has given a course of lectures on The Principles of School Administration with special attention to the French and German sys-

tems. A similar course devoted to the English school system will be given during the academic year 1914–15. *One hour a week, half a year.*

The courses as announced above may be modified somewhat as the needs of the students or other circumstances may require.

THE CHILDREN'S INSTITUTE

The Children's Institute, under the auspices of the Educational Department of Clark University, provides lectures each year, in the small lecture-room on the second floor of the new wing of the library building, from nine to ten o'clock on Saturday mornings, open not only to students but to all others interested. This work varies from year to year. During the present academic year Dr. Theodate L. Smith has lectured upon Child Welfare Institutions and Methods; Prof. U. Waldo Cutler upon Community Organization for Social Service; Dr. Amy E. Tanner upon Child Study; Dr. Frank K. Sechrist upon the Psychology of Language; Mr. Samuel C. Kohs upon Mental Deficiency.

The Children's Institute has a large hall with three adjacent rooms, including one entire floor in the new Library Building devoted to an educational museum, which is equipped with hundreds of maps, charts, diagrams, illustrative and other apparatus gathered from many countries, to ease the work of teaching and make it more effective. This material is used in various departments, but especially by that of Education.

Special attention has been given to the collection of the circulars and other publications of nearly one hundred types of child welfare organizations with which the department seeks to keep in touch.

The library of the department has a large collection of EDUCATIONAL LITERATURE, being especially rich in German and French literature, and having a large number of official reports from various countries—English, French, German, Belgian, Swedish, etc.; also town and city reports, and reports of special institutions; and a collection of French, German, and American text-books.

The books are arranged under the following heads:

1. GENERAL.
2. HISTORY OF EDUCATION.
3. EDUCATIONAL SYSTEMS.
4. THE THEORY OF EDUCATION AND SPECIAL SCHOOL SUBJECTS.
5. EDUCATIONAL PSYCHOLOGY.
6. CHILD STUDY.
7. SCHOOL HYGIENE AND PHYSICAL EDUCATION.
8. TEXT-BOOKS.
9. MISCELLANEOUS.

Many of the more common educational books are accessible in the Worcester Public Library and have not been duplicated by the University. The large collection of educational text-books in the library of the American Antiquarian Society and its valuable historical material are also accessible to the University.

The collection of educational periodicals includes a large number of the best foreign journals—English, French, German, Swedish, etc.

The nucleus of an educational museum has been formed. This is now merged with the museum of the Children's Institute, and contains a valuable collection of educational apparatus, pictures, illustrative material for language lessons, *Anschauungsunterricht*, toys, kindergarten material, maps, charts, diagrams, text-books, lantern slides, moving picture films, photographs, and illustrative material of various kinds

in school hygiene, history, arithmetic, language, the natural sciences, etc. One room contains a collection of apparatus for the teaching of arithmetic, abacuses of various kinds, charts for counting, reckoning machines, number tablets, weights, measures, geometrical models, and astronomical charts and apparatus. Another room contains a collection of toys from different countries, a number illustrating scientific principles in physics and the like. A third room is devoted to apparatus and illustrative material in school hygiene. The collection includes seats and desks, charts illustrating good and bad posture, hygrometers, apparatus for ensuring cleanliness, for testing the air, charts illustrating the incidence of school diseases, the effects of antitoxins, etc. and a collection of the antitoxins for the various diseases. The main room is largely filled with pictures, models, maps, charts, and illustrative material for teaching the different school subjects and the different sciences. A catalogue of the department of School Hygiene in the Museum has been published. It is hoped that catalogues of other departments will soon be prepared. This museum is open to students, teachers, and others at definite times. It is now under the direction of Professor W. H. Burnham.

The *Pedagogical Seminary* is a journal issued at the University, and serves as a convenient medium of publication for special investigations undertaken in the department.

SPECIAL STUDENTS IN EDUCATION

In addition to the members of the University, special students are admitted during the year to the Saturday courses of Drs. Hall, Burnham and Capen in Education, for a fee of $20.

VIII. ECONOMICS AND SOCIOLOGY

The courses here outlined indicate the scope of the work offered. At least two hours work per week and a seminar are given each year.

1. Recent Economic Theory. This course is devoted to a comparative study of the theories of Marshall, Clark, Böhm-Bawerk, Fetter, Hobson and Carver, as presenting leading types of modern economic theory. The chief emphasis is placed on the problems of value and distribution; on the tendencies toward monopoly and other interferences with normal adjustments; and on the influence of the growth of coöperation and consolidation. This course should be preceded by at least an elementary study of economic theory. *One hour per week.*

2. Principles of Interpretation in Sociology. This deals with the various principles that have been used to interpret history and society. Various viewpoints and principles are taken up in turn, analyzed, their advantages and limitations discussed, and the results achieved by each indicated. Among those studied are: anthropo-geography; the philosophy of history; the great man theory; religion as a factor in social evolution; the economic interpretation of history; social economics; philanthropy; biological and organismic conceptions; the struggle of races; the division of labor; human interests; social control; imitation; social psychology; and like response to stimulus. *One hour per week.*

3. Problems of Population. Considers various laws of population as developed by Malthus, Spencer, Nitti and others; vital statistics, birth and death rates, heredity and selection with some attention to statistical methods; theories of racial decay; eugenics and race-regeneration; and biological and sociological conditions affecting the supply of genius. Lectures, reports, discussions. *One hour per week.*

4. Seminar. Given to reports on theses and selected portions of the current literature; some special inquiry along sociological lines is also pursued. *Two consecutive hours bi-weekly.*

IX. HISTORY

Dr. Blakeslee offers the following courses:

1. United States History. Different periods are taken for intensive study in successive years. In 1913–14 the course is dealing with the history of the United States from the Missouri Compromise to the outbreak of the Civil War, with emphasis upon the years following the Compromise of 1850. It treats especially the institution of slavery as it existed in the Southern States, the origin and growth of the abolition sentiment, the doctrine of states rights, and the development of the antagonism between the North and the South till its culmination in the Civil War. In 1911–12 it covered the period from the close of the Civil War to the present time, and included the economic and social development of the country during these years as well as the history of politics; in 1912–13 it included the period from the formation of the constitution to the Missouri Compromise. The lectures are supplemented by reports presented by students upon assigned topics. *Two hours.*

2. The Expansion of the United States. The history of the successive territorial acquisitions of the United States is given, including the diplomatic negotiations and the relations with foreign powers. This is followed by a study of the constitutional questions involved, especially those regarding the status of newly acquired possessions and of present-day dependencies; the differences between incorporated and unincorporated territory; and the rights and privileges of inhabitants and citizens of the various lands considered. The aims and the continuity of the American Colonial policy are pointed out. *One hour.*

3. International Law. The aim of this course is to give a knowledge of the general principles of International Law. So far as possible definite cases are studied, and for that purpose Scott's "Cases on International Law" are followed. Especial attention is paid to the legal questions involved in the existing international controversies; to the history and present status of arbitration; and to the modifications in International Law introduced by such international Congresses as those held at the Hague. The study of the leading authorities and of cases is supplemented by lectures and discussions. *Two hours.*

4. English History—The Period of the Tudors and the Stuarts. The course extends from the accession of Henry VII, in 1485, to the death of Queen Anne, in 1714, and deals especially with the establishment of practical absolutism under Henry VII and Henry VIII; the rise of Protestantism; the development of Puritanism in state and church; the great Civil War; Cromwell and the Puritan ascendency; the attempts to form a firm constitutional government; the relation of English Puritanism to that of Switzerland and New England; the restoration of monarchy; and the final triumph of Parliament in the overthrow of James II. Emphasis is placed upon the study of the constitutional documents and other sources. *Two hours.*

5. Russia. The lectures discuss particularly the revolutionary movement, including the abuses of autocracy and bureaucracy, the character and methods of the revolutionists, the economic and political ability of the peasants, the widespread acceptance of socialism by the educated classes, the influence of the church, and the recent reforms by the government. *One hour. One Semester.*

6. The Far East. The lectures deal with Russia in Asia; Japan, with its colonies, Formosa and Korea; Manchuria, including the history and present status of the struggle for its control; China and the present revolution; the Philippines and Hawaii; and the International politics of the Far East and of the Pacific Ocean. *One hour. One Semester.*

7. British Colonies and Dependencies. A survey of the important political, economic and social conditions in the leading British possessions, especially in Canada, Australia, New Zealand, India and Egypt; and a discussion of British colonial policy and problems. *One hour. One Semester.*

8. The Near East and Africa. A discussion of the Balkan situation; the history, the achievements, and the problems of the Turkish Revolution; the extent and the significance of the political awakening and the religious revival throughout the Mohammedan world; the causes, progress and results of the Balkan-Turkish war; the history of the partitioning of Africa among the European powers; the character of European government in Africa, especially that of the Congo Free State; the results of the Boer war in British South Africa; the nationalist movement in Egypt and the successes and failures of the British administration; the achievements of the native races; and a study of the results and the methods of mission work. *One hour.*

9. Latin America. The history of the various countries will be studied first: this will be followed by a consideration of international

diplomacy, political problems, systems of government, race questions, and economic and industrial conditions. Especial emphasis is placed upon the past and present relations, both in trade and diplomacy, between the United States and the countries of Latin America; this involves a careful study of the Monroe Doctrine. The lectures are based, in part, upon material which has been secured in a recent trip to South America. *Two hours.*

10. Historical Seminar. The students in the Department of History meet once a week in a seminar for the consideration of particular topics of historical interest. Each member is expected to present reports during the year, which then form the basis for a critical discussion.

During the present year, 1913–14, courses 1, 9 and 10 are given.

Dr. Gras offers the following courses:

1. The Economic History of Europe from 1300 to the Present. The work in this course consists largely of oral reports. These are commented upon by the lecturer and made the basis of general discussion. Such topics as the following are studied: the origin of towns, the decay of the manor, the rise of a free tenant class, the revolts of 1381 and 1525, the enclosure movement; the Hanseatic League, Italian commercial supremacy, the formation of national companies, the struggle for a market, the history of prices; medieval crafts, the domestic system of industry, the industrial revolution; mercantilism, the free-trade movement, modern protectionism, national economic regulation. The object of the course is in part to familiarize the student with the literature on the subject. A reading knowledge of French and German is of great service. (Given 1912–13.) *Two hours.*

2. The Economic and Political History of Europe since 1789. Lectures are delivered on such topics as the French revolution, the Napoleonic régime, the proletarian upheavals, the industrial revolution, the history of trade unionism, socialism and syndicalism, the formation of the German Empire and of the Kingdom of Italy, the struggles of the papacy. *Two hours.*

3. The History of Economic Stages. The accepted economic stages are examined in detail, the agricultural, industrial, commercial and politico-economic. Most of the work, however, is constructive, an effort being made to synthesize the various schemes into one system centering about the market. *Two hours.*

4. The Renaissance in Europe. An analysis is made of the move-

ment in its various aspects. The problems of its origin are studied, its relation to the economic progress of towns, to the development of Gothic art and to the discoveries of classical models; also its relation to the condition of the Catholic Church, the Protestant reformation and the counter-reformation. *Two hours.*

During the year 1913–14, course 2 is given.

The most distinctive feature of the work in this Department is the insistence that its students shall obtain a general knowledge of the history of the world as a whole, not merely of the United States and of three or four of the states of Europe. The laws of historical development can be fully understood only after a study of all important peoples, including those in Asia, Africa and Latin America. Emphasis is placed upon existing conditions, both because these are most vital and because they furnish the richest material for a comparative study of the different stages in the world's political, economic, social and religious advance.

ANNUAL HISTORICAL CONFERENCES

In carrying out these features of its work, the Department has assisted the President of the University in arranging annual conferences for the discussion of the history and the present-day conditions of various lands. In 1909 the sessions dealt with the Far East, including China, Korea, India, the Philippines and Hawaii; in 1910 with the Near East and Africa; in 1911 with Japan and Japanese-American relations; in 1912 with Recent Developments in China; and in 1913 with Latin America. Altogether more than one hundred and fifty men have taken part in these conferences —University professors, anthropologists, leading natives, government officials, travellers and missionaries—all of whom could speak with authority. Their addresses and papers are published by the University in the *Journal of Race Development.*

LIBRARY

The Library is under the control of a Library Committee, appointed by the Trustees, of which the President of the University is *ex officio* chairman. The duties of this committee are to advise concerning the arrangement, cataloguing, use of books, and other matters pertaining to the Library not reserved to the Trustees nor otherwise provided for.

Library Committee

President G. Stanley Hall, *Chairman*
President Edmund C. Sanford
Professor William E. Story, *Secretary*

Library Staff

Louis N. Wilson, *Librarian*

Assistants

Edith M. Baker, *Senior Assistant*
Helen J. Elliot, *Cataloguer*
Beatrice M. Abbott — Ethel I. Burwell
Madge F. Trow — Frances Huelster
Theodate L. Smith

The Library building is situated on the corner of Main and Downing streets. The Public Opening of the building was held January 14th, 1904. A full description of the building and of the Proceedings at the Opening will be found in the *Publications of the Clark University Library* for April, 1904 (Vol. 1, No. 3).

The College Library and study rooms occupy the lower floor of the new building, opened in September, 1910, and described in the College Record, July, 1910, Vol. 5, pp. 185-187.

The Library contains about 66,000 bound volumes and pamphlets, and the reading-room receives over 450 journals.

The books are grouped as follows:

A	Works of General Reference	L	Biography
B	Journals	M	Anthropology
C	Mathematics	N	Education
CD	Math.-Physics	O	General Science
D	Physics	P	History
DE	Physical Chemistry	R	Political and Social Science
E	Chemistry		
F	Biology, Zoölogy, Botany, Physiology, Neurology	S	English
		T	Modern Languages
G	Geography	U	Classics
H	Pathology	W	Practical Arts
I	Psychology	X	Library Science
J	Philosophy	Y	Art
K	Religious Psychology	Z	Manuscripts

Tuesday and Friday mornings, each week, all books recently added to the library are placed upon a table in the Reference section where they remain for three days. This affords the members of the University and College an opportunity to examine the new books in all departments before they are placed upon the shelves for circulation.

About once a month, during term, by the courtesy of our booksellers, new books are placed for inspection on one of the tables in the Reference section. Any member of the University or College may recommend the purchase for the library of books thus displayed, and such recommendation will receive prompt attention.

All books are classified by the heads of departments and particular attention is paid to the needs of students engaged in research work. The library already possesses a good collection of complete sets of the best scientific periodicals. It makes liberal purchases for individual needs and supplements these by drawing upon the resources of the older and larger libraries through the inter-library loan system. During the past year 197 volumes were borrowed from, and 148 volumes lent to, other libraries. The number of books added each year is about four thousand volumes.

The publications of the Library, edited by the Librarian, and begun in October, 1903, are as follows:

VOL. I.

No. 1. WILSON, LOUIS N.
Bibliography of the Published Writings of President G. Stanley Hall. Oct. 1903

No. 2. WILSON, LOUIS N.
Bibliography of Child Study for the Year 1902. Jan. 1904

No. 3. Proceedings and Addresses at the Public Opening of the Library Building of Clark University, Thursday, January 14, 1904 Apr. 1904

No. 4. WILSON, LOUIS N.
Bibliography of Child Study for the Year 1903. July 1904

No. 5. WILSON, LOUIS N.
Preparing Manuscript for the Press. Jan. 1905

No. 6. Founder's Day, Clark University. Apr. 1905

No. 7. WILSON, LOUIS N.
Bibliography of Child Study for the Year 1904. July 1905

No. 8. DE PEROTT, JOSEPH
The Probable Source of the Plot of Shakespeare's Tempest. Oct. 1905

No. 9. Proceedings and Addresses at the Public Opening of the Art Department of Clark University. Dec. 1905

VOL. 2.

No. 1. List of Books and Pictures in the Clark Memorial Collection. July 1906

No. 2. WILSON, LOUIS N.
Bibliography of Child Study for the Year 1905. Oct. 1906

No. 3. WILSON, LOUIS N.
A few Titles in Child Study. Apr. 1907

No. 4. Proceedings at the First Annual Banquet of the New England Association of Alumni of Clark University, and at the Banquet of the Washington, D. C., Alumni Association, 1907. June 1907

No. 5. WILSON, LOUIS N.
Bibliography of Child Study for the Year 1906. Aug. 1907

No. 6. Wilson, Louis N.
Bibliography of Child Study for the Year 1907.
Sept. 1908

No. 7. Maclaurin, Richard C.
The Outlook for Research (Founder's Day Address, Feb. 1, 1911). Mch. 1911

No. 8. Wilson, Louis N.
List of Papers in the Field of Religious Psychology Presented at Clark University. July 1911

No. 9. Wilson, Louis N.
List of Degrees Granted at Clark University and Clark College.
Oct. 1911

VOL. 3.

No. 1. Roethlein, Barbara Elizabeth
The Relative Legibility of Different Faces of Printing Types.
Jan. 1912

No. 2. Wilson, Louis N.
Suggestions for a Model Private Library at Clark College.
Feb. 1912

No. 3. Burnham, William H.
Bibliographies on Experimental Pedagogy. July, 1912

No. 4. Wilson, Louis N.
Further suggestions for a Model Private Library at Clark College. April, 1913

No. 5. Burnham, William H.
Bibliographies on Educational Psychology. Sept. 1913

The books in the Art Department are accessible on application to the librarian, but, by the terms of the Founder's will, they cannot be taken from the building.

All the privileges of the Library are open to all members of the University, and each member has direct access to every book and journal.

The Library is open from 8 a.m. to 6 p.m. each week day from Sept. 1 to July 1. During July and August it is open from 8 a.m. to 5 p.m. from Mondays to Fridays, and on Saturdays from 8 a.m. to 12 m. The library is closed July 4th, Thanksgiving Day and Christmas Day.

Outside the University are found:

The Library of the American Antiquarian Society, organized in 1812, and containing over 125,000 volumes, accessible to all members of the University.

The Worcester Public Library, containing 600 newspapers and magazines and nearly 200,000 volumes, has, in the past, to some extent supplemented the scientific publications purchased by the University, and all its privileges are accessible without charge.

The Library of the Worcester District Medical Society of about 12,000 volumes, is also free to all members of the University.

LIBRARY RULES

No loud talking is allowed in any part of the Library.

Every book shall be returned at the end of one calendar month from the time at which it was taken out, but may be called in at any time at the discretion of the Librarian.

Current numbers of periodicals shall not be taken out until they have been in the Library ten days.

All dictionaries, cyclopædias, and books of general reference are permanently reserved.

Reserved books and current numbers of periodicals, exempt from circulation, may be taken out after 5.30 p.m., but must be returned before 9 o'clock the next morning, excepting that such books and periodicals may be taken out Saturdays at 12 o'clock m., and may be kept until 9 o'clock the next Monday morning.

Readers must not write nor make any mark upon any book, manuscript, map, or other property belonging to the Library.

Any breach of the above Rules will involve suspension of the Library privileges until personally restored by the Librarian. All such cases shall be laid before the Library Committee at their next meeting.

ART DEPARTMENT

In his last will and testament the Founder of the University bequeathed

"the sum of $100,000, as an endowment fund for the Art Department of said University, and said sum is to be held and kept sacred and intact as a principal not to be used or expended under any conditions; but the income, interest or proceeds thereof shall be used only in putting and keeping said works of art or others given or obtained for said department in good condition and in taking care of them; and then if there is a surplus of the income of said fund left, I will and direct that it be used in the purchase of additional works of art or of such matters as will add to the usefulness and efficiency of said Art Department."

Under these conditions a large room has been furnished and equipped on the upper floor of the Library Building. Upon the death of Mrs. Clark, those of the Founder's collections that were deemed most suitable for this purpose were arranged and displayed in this room, together with his most valuable books, which, by the conditions of the will, cannot be removed from the building. A complete catalogue of these books and paintings has been published in the PUBLICATIONS OF THE LIBRARY, Vol. 2, No. 1.

A Curator and Custodian have been appointed by the Board (see page 113) and all the collections are now accessible to visitors. The Art Department is open daily (except Sundays) from 9 a.m. to 5 p.m.

In 1909 there was added to the collection a large oil portrait of the late Carroll D. Wright, President of the Collegiate Department from 1902 to 1909. The painting is by the late Frederick P. Vinton of Boston and received the Temple Gold Medal at the 1909 Exhibition of the Pennsylvania Academy of the Fine Arts. In the spring of 1911 a similar portrait of President G. Stanley Hall of the University, also painted by Mr. Vinton, was added.

In 1913 the Trustees purchased the painting, Snowing, by Joseph H. Greenwood of Worcester, which was added to the collection.

Joseph DeCamp of Boston is now engaged upon a portrait of President Edmund C. Sanford of the College. This painting, corresponding in size to those of Presidents Hall and Wright, will be completed before commencement.

Scale models of the two new buildings and the University grounds have been made by T. J. McAuliffe and Son of Worcester, under the direction of the architects, Messrs. Frost, Briggs and Chamberlain.

REGULATIONS

1. All requisitions for apparatus must be made through the Bursar's office upon printed blanks provided for that purpose and signed by a member of the staff.

2. So far as possible, orders for only the kind and amount of apparatus certain to be used during the year shall be placed; nothing shall be ordered for future years, and apparatus for research shall take precedence over that for teaching and illustration only.

3. Requisitions for repairs, furniture, plumbing and work about the buildings must be made through the Bursar's office in writing and with detail, and, when once passed upon, no change involving additional expense can be made in the requisition without the consent of the Finance Committee.

4. No unappropriated rooms and no part of the University grounds shall be used for any purpose, and appropriated rooms shall not be used for other purposes than the stated University work for which they were intended, without previous permission from the office.

5. Unless for special reasons, absence of instructors from their stated exercises or from town for two consecutive week days in term time should be announced at the office, and for longer absence permission should be obtained beforehand.

6. The Trustees desire that no Instructor, Docent, or

Fellow shall enter upon other engagements outside his proper work in the University of a kind or amount likely to lessen his full efficiency for science within the University.

7. Appropriations shall hereafter cover all apparatus and supplies of whatever nature for laboratories, for demonstration or illustration; all metal and carpenter work connected with the scientific activity of each department; and every form of special service. Appropriations, however, shall not hereafter cover orders for books or journals, which shall be submitted to the Library Committee.

8. The several appropriations made to individual instructors and others shall be the full and fixed limit of the liability of the University, to be on no account transcended; and for every excess over the appropriations, from whatever cause, the instructor making the order shall be personally responsible.

9. No order for any purpose shall be paid by the University, whether on appropriations or for general supplies, that has not passed through the Bursar's office.

10. The President, Professors, Assistant Professors and regular Instructors authorized by the Board to do graduate work, together with the Librarian, shall constitute the Faculty of the University. Its meetings shall be called and presided over by its President, or, in his absence, by a Professor whom he shall designate. The Faculty shall elect a Secretary and its records shall always be accessible to the Trustees. Its jurisdiction shall include all matters pertaining to the instruction, conduct and discipline of students, and such other duties as may be prescribed by the Trustees.

11. The President of the University shall make, at the October meeting, an annual report on the condition of the departments and their work during the year and shall have authority to require and receive from all Instructors and Officers of the University and Library such reports as he may deem necessary. A copy of these reports, including that of the Library, shall be deposited with the Mayor of the City.

12. The University Faculty shall have the oversight of all graduate work and shall recommend for the Master's, Doctor's and all other graduate degrees upon such terms, conditions, and forms as it may determine, and exercise such other functions and responsibilities as are not expressly assigned to the Trustees or to the Collegiate Department.

13. The Custodian of the Art Collection shall have general oversight over its room in the Library Building and its contents, together with their care and use, under the direction and control of the Curator. The Curator shall from time to time submit to the Trustees his recommendations for the purchase of additional works of art from the income of the Art Fund, based on and together with the opinions of experts as to their value and desirability. All such purchases shall be approved by the Board of Trustees, or by such a committee of their members as they shall appoint for that purpose.

14. The President of the University shall make an annual report to the Trustees of the action of the Library Committee, of which he is Chairman, and this report, if approved, shall be filed and preserved.

DEGREES CONFERRED

On June 17, 1913, the University conferred degrees upon the following persons:

MASTER OF ARTS

Raymond Bellamy
Thesis: An Introductory Study of Dreams.

Samuel Flagg Bemis
Thesis: The Expansion of the United States Southward.

Lawrence Whitney Brigham
Thesis: The History and Diplomacy of the Panama Canal.

Fred Winfred Chaplin
Thesis: Society as a Physical Organism.

Samuel Claman
Thesis: The Correlation between Physical Defects and Retardation in School Children.

Charles Henry Cummings
Thesis: A Study of Children's Interests.

Raymond Augustine Dunphy
Thesis: A New Method of Determining Molecular Boiling-Point Elevations. The Partial Vapor Pressures of Ternary Mixtures.

George Earl Freeland
Thesis: Education through Spontaneous Activity and Toys.

Arthur Edward Hamilton
Thesis: Eugenics.

Marion Myrl Harrison
Thesis: Dynamics of the Decomposition of Tertiary Amyl Benzoate.

Henry Jacobson
Thesis: A Historical Résumé of Some Religious Phenomena in America.

George Ellis Jones
Thesis: Tuberculosis among School Children.

Abraham Mandelstam

Thesis: Oxygen in Relation to Fatigue.

Harold Arthur Morton

Thesis: The Theory of the Variable Specific Rotation of the Sugars.

Francis John O'Brien

Thesis: The Hygiene and Pedagogy of Play.

George Bernard O'Flynn

Thesis: The Educational Value of the Garden-City.

Carl Lisle Percy

Thesis: Changes in the Religious and Social Standards and Customs of a Massachusetts Town.

Allan Gale Rice

Thesis: The History of Liberia.

John Francis Sullivan

Thesis: Vocational Guidance.

Francis Aloysius Tobin

Thesis: A Study of Sophistic Education.

Frances Washington Tufts

Thesis: A Study of Root Systems with Methods for their Investigation.

Mary Alice Waite

Thesis: Working Women in Department Stores.

Raymond Holder Wheeler

Thesis: A Preliminary Experimental Study of Volition.

DOCTOR OF PHILOSOPHY

Arthur Kennedy Beik

Dissertation: Physiological Age and School Entrance.

George Davis Bivin

Dissertation: A Study in Psychosynthesis.

Irving Angell Field

Dissertation: The Biology and Economic Value of the Sea Mussel, *Mytilus edulis*.

Erwin Oliver Finkenbinder

Dissertation: The Remembrance of Problems and of Their Solution: A Study in Logical Memory.

Sara Carolyn Fisher

Dissertation: The Processes of Abstraction and Generalization and their Products.

Albert Nicolay Gilbertson

Dissertation: Some Ethical Phases of Eskimo Culture.

Arthur Taber Jones

Dissertation: Acoustic Repulsion of Jets of Gas.

Roy Franklin Richardson

Dissertation: A Study of Anger.

Kirkman K. Robinson

Dissertation: The Evolution of Plato's Life and Philosophy: A Genetic Study.

Frank K. Sechrist

Dissertation: The Psychology of Unconventional Language.

Adele Adams Steele

Dissertation: Changing Conceptions of Childhood.

Asa George Steele

Dissertation: The Organization and Control of the College.

Miriam Van Waters

Dissertation: The Adolescent Girl among Primitive Peoples.

Elizabeth Lindley Woods

Dissertation: An Experimental Study of Recognition.

Soschichi Yamada

Dissertation: A Study of Questioning.

Elias Yanovsky

Dissertation: Esterification Catalysis.

PUBLICATIONS

A Register and Official Announcement is issued each year in February or March.

In the years 1890, 1891, 1893, and 1902, the annual Report of the President to the Board of Trustees was printed.

A Summer School was held for nine years ending in 1903, and in such years a Summer School Programme was issued.

In July, 1899, the University observed its tenth anniversary, and published the following volume:

Clark University, 1889-1899. Decennial Celebration. 8 x 11 in., pp. 566. Published for the University. Price, $5.00. Contains the lectures delivered by Professors Picard, Boltzmann, Ramon y Cajal, Mosso and Forel at the Decennial Celebration, July, 1899; also reports by the heads of departments on their aims and ideals, with a list of past and present members of the University and the titles of their published papers.

Proceedings of the Child Conference for Research and Welfare. Conferences held at Clark University in the summers of 1909 and 1910. Vol. 1, 1909, 257 p., contains 48 papers on problems relating to child welfare. Vol. 2, 1910, 287 p., contains 34 papers, on similar subjects. The

papers in Vol. 1 were reprinted from the Pedagogical Seminary for September and December 1909, but those in Vol. 2, with one exception, have not been printed elsewhere. Price $2.00 per volume in paper, $2.50 in cloth. Louis N. Wilson, Publisher, Worcester, Mass.

In connection with the celebration of the 20th anniversary of Clark University in September, 1909, conferences and lectures were held in the Departments of Psychology and Education to which distinguished scientists and educators in this and other countries contributed. Lectures were given in Pedagogy and Psychiatry by Prof. Sigmund Freud of the University of Vienna and Dr. Carl C. Jung of the University of Zürich; in Psychology by Prof. William Stern of the University of Breslau, by Prof. E. B. Titchener of Cornell University, Prof. Franz Boas of Columbia University, Prof. H. S. Jennings of Johns Hopkins University, and Dr. Adolf Meyer of the Johns Hopkins Medical School; and in School Hygiene by Prof. Leo Burgerstein of the University of Vienna. The conferences in Psychology were presided over by Prof. Guy Montrose Whipple of Cornell University and Prof. Carl E. Seashore of the University of Iowa; and those in Education by Dr. Elmer Ellsworth Brown, U. S. Commissioner of Education, Prof. F. B. Dresslar of the University of Alabama, and Dr. Thomas A. Storey of the College of the City of New York. The lectures in Psychology, Education and School Hygiene and the papers presented at the Educational Conferences have been published in a volume entitled *Lectures and Addresses Delivered Before the Departments of Psychology and Pedagogy in Celebration of the 20th Anniversary of the Opening of Clark University.* Worcester, 1910.

Chemical Addresses: A collection of papers presented at the chemical conferences of the Second Decennial Celebration of Clark University. The collection has been published

jointly by Clark University and the American Chemical Society. In organizing the conferences an effort was made to have all the more important branches of chemical research represented by competent lecturers. The collection includes:

1. Professor Marston Taylor Bogert, of Columbia University: *A Review of Some Recent Investigations in the Quinazoline Group.*

2. Professor John E. Bucher, of Brown University: *The Acids of the Phenyl-Propiolic Series and Their Condensation to Naphthalene Derivatives.*

3. Dr. André Debierne, of the University of Paris, France: *Review of Recent Progress in Radioactive Chemistry.*

4. Dr. C. S. Hudson, of the United States Department of Agriculture: *A Review of Discoveries on the Mutarotation of the Sugars.*

5. Dr. P. A. Levene, of the Rockefeller Institute of Medical Research: *Review of Recent Progress in Bio-Chemistry.*

6. Professor Arthur Michael, sometime Director of the Department of Chemistry in Clark University: *A Theory of Organic Chemistry Founded on the Law of Entropy.*

7. Professor S. P. Mulliken, of the Massachusetts Institute of Technology (formerly of Clark University): *Progress in Systematic Qualitative Organic Analysis.*

8. Professor William A. Noyes, of the University of Illinois: *Molecular Rearrangements of Carbon Compounds.*

9. Professor Theodore William Richards, of Harvard University: *Review of Recent Advances in Thermochemistry.*

10. Mr. Michael D. Sohon, of the Morris High School, New York: *Secondary School Chemistry: Method of Teaching It and Content of the Course.*

11. Professor Julius Stieglitz, of the University of Chicago (formerly of Clark University): *Catalysis, on the Basis of Work with Amido-Esters.*

12. Professor H. P. Talbot, of the Massachusetts Institute of Technology: *Correlation of the Chemical Courses in Secondary Schools and Colleges.*

13. Professor Edward W. Washburn, of the University of Illinois: *The Fundamental Law for a General Theory of Solutions.*

14. Dr. Willis R. Whitney, President of the American Chemical Society, Director of the Research Laboratories of the General Electric Company: *Organization of Industrial Research.*

15. Mr. Jesse E. Whitsit, of the De Witt Clinton High School, New York: *Secondary School Chemistry: Content of the Course.*

The above papers have already been gradually published, partly in *Science*, but mostly in the *Journal of the American Chemical Society.* Further papers, presented at the Clark Celebration by Professor Wilder D. Bancroft, of Cornell University, Professor Gilbert Newton Lewis, of the Massachusetts Institute of Technology, and Professor James F. Norris, of Simmons College, could not be prepared for publication.

LECTURES delivered at the celebration of the Twentieth Anniversary of the foundation of Clark University under the auspices of the Department of Physics.

Vito Volterra, University of Rome: *Sur quelques progrès récents de la physique mathématique.* Three lectures.

Ernest Rutherford, University of Manchester, Nobel laureate: *The History of the Alpha Rays from Radioactive Substances.*

Robert Williams Wood, Johns Hopkins University, Rumford medallist, American Academy of Arts and Sciences: *The Optical Properties of Metallic Vapors.*

Carl Barus, Brown University, Rumford medallist, American Academy of Arts and Sciences: *Certain Physical Properties of the Iron Carbides, together with Inferences Deducible Therefrom.*

Published by Clark University, pp. 161, $2.00.

JAPAN AND JAPANESE-AMERICAN RELATIONS, pp. xi, 348 New York: G. E. Stechert and Company, 1912, $2.50. Edited by Professor George H. Blakeslee. The volume contains twenty-two of the addresses delivered by the experts, both Japanese and American, who met at the Clark University Historical Conference, November, 1911. Each of the chapters deals with a distinct topic; together they cover progressively the field of what is both most interesting and most vital in the present national and international situation of Japan.

Recent Developments in China, pp. xi, 413, New York: G. E. Stechert and Company, 1913, $2.50. Edited by Professor George H. Blakeslee. These twenty-two addresses, given at the Clark University Conference, November, 1912, by Chinese and Americans who have a recent, intimate and authoritative knowledge of China, present the underlying causes of the Revolution, and the progress and problems of the Chinese people in government, education, social welfare, industry and religion.

JOURNALS CONNECTED UNOFFICIALLY WITH THE DEPARTMENTS

The American Journal of Psychology. This journal was commenced in November, 1887, and is now edited by G. Stanley Hall, E. C. Sanford, E. B. Titchener (Cornell University), and J. W. Baird, with the assistance of an international board of co-operators. Each volume contains four numbers—issued in January, April, July and October. Besides original articles, a considerable portion of its space is devoted to careful digests of the important literature in its field. Price $5 per volume; single numbers, $1.50. Florence Chandler, Publisher, Worcester, Mass.

The Pedagogical Seminary. This journal was begun in January, 1891, and is edited by the President of the University with the assistance of William H. Burnham, Professor of Pedagogy. It is an international record of educational literature, institutions and progress, and is devoted solely to the highest interest of education in all grades, with digests of important literature of all

countries. It is the organ of the Educational Department of the University. Each volume contains four numbers—issued in March, June, September and December. Price $5 per volume; single numbers, $1.50. Florence Chandler, Publisher, Worcester, Mass.

Journal of Religious Psychology (including its anthropological and sociological aspects). This journal was begun in May, 1904, and is now in its sixth volume. It is edited by President G. Stanley Hall and Professor Alexander F. Chamberlain. The aim of this journal is to publish original material from all parts of the field of religious psychology. Special attention is devoted to the literature of the subject, both books, monographs and articles in current periodicals. It is published quarterly, each volume (containing about 500 pages) beginning with the January issue. Price $3.00 per volume; single copies $1.00. Louis N. Wilson, Publisher, Worcester, Mass.

The Journal of Race Development. This journal was begun in July, 1910 and is edited by Dr. Blakeslee and President Hall with the coöperation of a board of sixteen contributing editors. It offers itself as a forum for the discussion of the problems which relate to the progress of races and states generally considered backward in their standard of civilization. Issued quarterly, each number containing about 125 pages. Price $2.00 per volume; 50 cts. per number. Louis N. Wilson, Publisher, Worcester, Mass.

UNIVERSITY COLORS

EMERALD GREEN AND WHITE

To be worn in the hood as a green chevron
on a white field

Clark University
in the City of Worcester
Massachusetts

Register and Twenty-seventh Official Announcement

1915

CLARK UNIVERSITY

WORCESTER, MASSACHUSETTS

REGISTER AND TWENTY-SEVENTH OFFICIAL ANNOUNCEMENT

WORCESTER, MASSACHUSETTS
Published for the University
January, 1915

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* Died November 30, 1914

Alexander Francis Chamberlain

Fellow in Anthropology
1890–1892

Lecturer in Anthropology
1892–1900

Assistant Professor of Anthropology
1900–1911

Professor of Anthropology
1911–1914

Born at Kenninghall, England, January 12, 1865
Died at Worcester, Massachusetts, April 8, 1914

CALENDAR 1915–1916

1915		
FEB. 1	Monday	Founder's Day*
FEB. 22	Monday	Washington's Birthday
APRIL 5	Monday	Spring Recess
APRIL 10	Saturday	
APRIL 19	Monday	Patriots' Day
MAY 31	Monday	Memorial Day
JUNE 17	Thursday	Twenty-sixth academic year closes

Summer Vacation of 14 Weeks

SEPT. 23	Thursday	Twenty-seventh academic year begins
OCT. 12	Tuesday	Columbus Day
NOV. 25	Thursday	Thanksgiving Day
DEC. 24	Friday	Christmas Recess
1916		
JAN. 1	Saturday	
FEB. 1	Tuesday	Founder's Day*
FEB. 22	Tuesday	Washington's Birthday
APRIL 3	Monday	Spring Recess
APRIL 8	Saturday	
APRIL 19	Wednesday	Patriots' Day
MAY 30	Tuesday	Memorial Day
JUNE 15	Thursday	Twenty-seventh academic year closes

*Not a holiday

MEMBERS

STAFF

GRANVILLE STANLEY HALL, PH.D., LL.D. 156 Woodland St.
President of the University and Professor of Psychology

A.B., Williams College, 1867; A.M., 1870; Ph.D., Harvard University, 1878; Lecturer in Harvard and Williams Colleges, 1880–81; Professor of Psychology, Johns Hopkins University, 1881–88; President and Professor of Psychology, Clark University, 1888–; LL.D., University of Michigan, 1888, Williams College, 1889, and Johns Hopkins University, 1902; Chairman of the Library Committee and Curator of the Art Collection, Clark University. Resident Member of the Massachusetts Historical Society.

WILLIAM EDWARD STORY, PH.D. 17 Hammond St.
Professor of Mathematics and Secretary of the Faculty

A.B., Harvard University, 1871; Ph.D., University of Leipzig, 1875; Parker Fellow (Harvard), 1874–75; Tutor of Mathematics, Harvard University, 1875–76; Associate, Assistant Professor, and Associate Professor of Mathematics, Johns Hopkins University, 1876–89; Professor of Mathematics, Clark University, 1889–; Professor of Mathematics, Clark College, 1902–07. Member of the National Academy of Sciences; Member of the London Mathematical Society; Resident Fellow of the American Academy of Arts and Sciences.

EDMUND CLARK SANFORD, PH.D., SC.D., LL.D.
Lecturer on College Administration 160 Woodland St.

A.B., University of California, 1883; Fellow, Johns Hopkins University, 1887; Ph.D Johns Hopkins University, 1888; Instructor in Psychology, Johns Hopkins University, 1888; Instructor in Psychology, Clark University, 1889-92; Assistant Professor 1892–1900; Professor of Psychology, Clark College, 1903–07; Professor of Experimental and Comparative Psychology, Clark University, 1900–09; Lecturer on College Administration, 1909–; Sc.D , Hobart College, 1909; President of Clark College, 1909–; LL.D., University of California, 1912.

ARTHUR GORDON WEBSTER, PH.D., SC.D., LL.D.
Professor of Physics 66 West St.

A.B., Harvard University, 1885; Instructor in Mathematics, Harvard University 1885–86; Parker Fellow, 1886–89; Student, Universities of Berlin, Paris, Stockholm, 1886–90; Ph.D., University of Berlin, 1890; Docent in Physics, Clark University, 1890–

92; Assistant Professor, 1892–1900; Professor, 1900–; Professor of Physics, Clark College, 1902–07; Director of Physical Laboratories; Sc.D., Tufts College, 1905; LL.D., Hobart College, 1908. Member of the National Academy of Sciences; Resident Fellow of the American Academy of Arts and Sciences; Member of the American Philosophical Society.

HENRY TABER, PH.D.

Professor of Mathematics — 26 Dayton St.

Ph.B., Yale University, 1882; Ph.D., Johns Hopkins University, 1888; Assistant in Mathematics, Johns Hopkins University, 1888–89; Docent in Mathematics, Clark University, 1889–92; Assistant Professor, 1892–1903; Professor, 1903–; Member of the London Mathematical Society; Resident Fellow of the American Academy of Arts and Sciences.

WILLIAM HENRY BURNHAM, PH.D.

Professor of Pedagogy and School Hygiene — 767 Main St.

A.B., Harvard University, 1882; Instructor in Wittenberg College, 1882–83; Instructor, State Normal School, Potsdam, N. Y., 1883–85; Fellow, Johns Hopkins University, 1885–86; Ph.D., 1888; Instructor in Psychology, 1888–89; Docent in Pedagogy, Clark University, 1890–92; Instructor, 1892–1900; Assistant Professor, 1900–06; Professor, 1906–.

GEORGE HUBBARD BLAKESLEE, PH.D.

Professor of History and International Relations, 21 Downing St.

A.B., Wesleyan University, 1893; A.M., Harvard University, 1899; Ph.D., 1903; Student, Johns Hopkins University, 1893–94; Parker Fellow, Harvard, 1901–02; Student, Universities of Berlin, Leipzig, and Oxford, 1901–03; Instructor in History, Clark College, 1903–04; Assistant Professor, 1904–09; Professor, 1909–; Instructor in History, Clark University, 1905–11; Professor, 1911–.

JOHN WALLACE BAIRD, PH.D. — 801 Pleasant St.

Professor of Experimental Psychology

A.B., University of Toronto, 1897; Student, University of Leipzig, 1898–99; Fellow, University of Wisconsin, 1899–1901; Fellow, Cornell University, 1901–02; Ph.D., 1902; Assistant in Psychology, 1902–03; Carnegie Research Assistant, 1903–04; Instructor in Psychology, Johns Hopkins University, 1904–06; Instructor in Psychology, University of Illinois, 1906–07; Assistant Professor, 1907–February, 1910; Assistant Professor of Experimental Psychology, Clark University, February, 1910–February, 1913; Professor, February, 1913–.

RALPH STAYNER LILLIE, PH.D

Professor of Biology — 21 Dayton St.

A.B., University of Toronto, 1896; Student, University of Michigan, 1896–97; Fellow, University of Chicago, 1898–1901; Ph.D., 1901; Assistant in Physiology, Harvard University, 1901–02; Instructor, University of Nebraska, 1902–03; Adjunct Professor, 1903–04; Carnegie Research Assistant at Zoölogical Station, Naples, 1904–05; In-

structor in Physiology, Harvard University, 1905-06; Johnston Scholar, Johns Hopkins University, 1906–07; Instructor in Physiological Zoölogy, University of Pennsylvania, 1907–12; Assistant Professor of Experimental Zoölogy, 1912–13; Instructor in General and Comparative Physiology, Marine Biological Laboratory, Woods Hole, Mass., 1902–; Professor of Biology, Clark University, October 1913–.

CHARLES A. KRAUS, PH.D.
Professor of Chemistry — 11 Downing St.

B.S., University of Kansas, 1898; Fellow in Physics, Johns Hopkins University, 1899–1900; Research Fellow, Kansas University, 1900–01; Instructor in Physics, University of California, 1901–03; Research Assistant, Massachusetts Institute of Technology, 1904–08; Ph.D., 1908; Research Associate, 1908–12; Assistant Professor of Physical Chemical Research, 1912–14; Professor of Chemistry and Director of the Chemical Laboratories, Clark University, 1914–.

JOSEPH DE PEROTT
Lecturer in Mathematics — 5 Hawthorn St.

Student, Universities of Paris and Berlin, 1877–80; Docent in Mathematics, Clark University, 1890–1904; Lecturer, 1904–.

LOUIS N. WILSON, LITT.D. — 11 Shirley St.
Librarian of the University and Custodian of the Art Collection

Litt.D., Tufts College, 1905.

FRANK HAMILTON HANKINS, PH.D.
Instructor in Economics and Sociology — 4 Cabot St.

A.B., Baker University, 1901; Student, Columbia University, 1903–04; Scholar in Sociology, 1904–05; Fellow in Statistics, 1905–06; Student, 1907–08; Ph.D., Columbia University, 1908; Instructor in Economics, Clark College, 1906–07; Assistant Professor, 1908–13; Professor of Political and Social Science, 1913–; Instructor in Economics and Sociology, Clark University, 1906–07; 1908–.

JOHN CHARLES HUBBARD, PH.D.
Instructor in Physics — 8 Loudon St.

B. S., University of Colorado, 1901; Scholar in Physics, Clark University, and Assistant to Professor Webster, 1901–02; Fellow, 1902–04; Ph. D., Clark University, 1904; Instructor in Physics, Simmons College, 1904–05; Asssistant Professor of Physics, New York University, 1905–06; Assistant Professor of Physics, Clark College, 1906–11; Professor, 1911–; Honorary Fellow in Physics, Clark University, 1907–09; Instructor, 1910–.

FRANK BLAIR WILLIAMS, PH.D.
Instructor in Mathematics — 2 Isabella St.

C.E., University of Missouri, 1890; M. S., 1893; Engineering Work with the Mississippi River Commission, 1890–92; Teaching Fellow in Mathematics, University of

Missouri, 1892–93; Survey Work with the Mississipi River Commission, 1894–95; United States Assistant Engineer in Tennessee River Improvement, 1895–97; Scholar in Mathematics, Clark University, 1897–98; Fellow, 1898–1900; Ph.D., 1900; Assistant Professor of Civil Engineering, Union College, 1900–05; Assistant Professor of Engineering and Mathematics, 1905–06; Professor of Engineering Mathematics, 1906–07; Assistant Professor of Mathematics, Clark College, 1907–08; Professor, 1908–; Honorary Fellow in Mathematics, Clark University, 1909–10; Instructor, 1910–.

Annual Appointments

Edward Cowles, M.D., LL.D., Boston
Non-Resident Lecturer in Psychiatry

A.B., Dartmouth College, 1859; A.M., 1863; Medical House Pupil, Retreat for the Insane, Hartford, Conn., 1860–62; M.D., Dartmouth Medical School, 1863; M.D., College of Physicians and Surgeons, New York, 1863; Medical Corps, United States Army, 1863–72; Resident Physician and Superintendent, Boston City Hospital, 1872–79; Medical Superintendent, McLean Hospital, Waverley, Mass., 1879–1903; Lecturer on Mental Diseases, Dartmouth Medical School, 1885–86; Professor of Mental Diseases, 1886–; Fellow by Courtesy, Johns Hopkins University, 1887–88; Clinical Instructor in Mental Diseases, Harvard Medical School, 1888–; LL.D., Dartmouth College, 1890; Non-Resident Lecturer in Psychiatry, Clark University, 1903–.

Samuel Weiller Fernberger, Ph.D.
Instructor in Experimental Psychology — 767 Main St.

B.S., University of Pennsylvania, 1908; M.A., 1909; Ph.D., 1912; Assistant in Psychology, University of Pennsylvania, 1908–09; Instructor, 1910–12; Instructor in Experimental Psychology, Clark University, 1912–.

Norman Scott Brien Gras, Ph.D. — 23 Maywood St.
Lecturer in History

A.B., Western University, 1906, A.M. 1906; A.M., Harvard University, 1909; Ph.D., 1912; University Scholar, Harvard University, 1907–08; Goodwin Fellow, 1908–09; Kirkland and Sheldon Traveling Fellow (Europe), 1910–12; Instructor in Economics, Western University, 1905–06; Assistant in History, Harvard University, 1909–10; Assistant Professor of History, Clark College, 1912–.

Karl Johan Karlson, Ph.D.
Lecturer in Philosophy — 6 Wyman St.

A.B., Clark College, 1909; Scholar in Psychology, Clark University, 1909–10; A.M., 1910; Fellow, 1910–12; Ph.D., 1912; Honorary Fellow in Psychology, Clark University, 1912–14.

Amy Eliza Tanner, Ph.D.

Research Assistant to President Hall — 48 Downing St.

A.B., University of Michigan, 1893; Scholar, University of Chicago, 1894–95; Fellow, 1895–98; Ph.D., University of Chicago, 1898; Associate in Philosophy, 1898–1902; Professor of Philosophy, Wilson College, 1903–07; Honorary Fellow in Psychology, Clark University, 1907–09; Lecturer in the Children's Institute, 1909–11; Research Assistant to President Hall, 1911–.

George Frederic White, Ph.D.

Docent in Biological Chemistry — 1 Lucian St.

S.B., Massachusetts Institute of Technology, 1906; Ph.D., Johns Hopkins University, 1910; Assistant in Analytical and Organic Chemistry, Massachusetts Institute of Technology, 1906–08; Fellow, Johns Hopkins University, 1909–10; Associate Professor of Chemistry, Richmond College, 1910–12; Chief Chemist, Woods Hole Laboratories of the United States Bureau of Fisheries, 1911–12; Instructor in Organic Chemistry, Clark College, 1912–13; Assistant Professor, 1913–.

Honorary Fellows

James Mace Andress, A.M.

Honorary Fellow in Pedagogy — 37 Circuit Ave.

B.Pd., Michigan State Normal College, 1905; A.B., 1905; Graduate Student, University of Chicago, 1905–06; Ph.M., 1906; Instructor in History and Education, Manchester College, 1906–07; Scholar in Education, Harvard University, 1907–08; A.M., 1908; Instructor in Educational Psychology, History of Education, Hygiene, State Normal School, Worcester, Mass., 1908–; Student in Psychology, Clark University, 1913–14.

Arthur Dexter Butterfield, A.M.

Honorary Fellow in Mathematics — 10 Schussler Road

B.S., Worcester Polytechnic Institute, 1893; M.S., 1898; A.M., Columbia University, 1904; Instructor in Civil Engineering, Worcester Polytechnic Institute, 1894–98; Instructor in Mathematics, Engineering Department, Universityof Vermont, 1898–1900; Assistant Professor, 1900–04; Professor of Mathematics and Mehanics, 1904–08; Assistant Professor of Mathematics, Worcester Polytechnic Institute, 1908–10; Professor, 1910–; Student in Physics and Mathematics, Clark University, 1908–09; Honorary Fellow in Mathematics, 1909–.

U. Waldo Cutler, B.S.

Honorary Fellow in Psychology and Lecturer in the Children's Institute — 63 Lancaster St.

B.S., Worcester Polytechnic Institute, 1874; Student at Leipzig, Göttingen and Geneva Universities, 1879–81; Instructor in Modern Languages, Worcester Polytechnic Institute, 1881–92; Professor, 1892–1903; Student, Johns Hopkins University, 1889; Honorary Fellow in Psychology, Clark University, 1905–07; Honorary Fellow and Lecturer in the Children's Institute, 1913–.

IRVING ANGELL FIELD, PH.D., Auburn

Honorary Fellow in Biology

B.S., Denison University, 1903; Instructor in Ornithology, 1902–03; Assistant in Zoölogy, Harvard University, 1903–05; Austin Teaching Fellow, 1905–06; Professor of Chemistry and Biology, Western Maryland College, 1906–11; A.M., Harvard University, 1912; Instructor in Biology, Clark College, 1911–13; Honorary Fellow in Biology, Clark University, 1911–; Ph.D., 1913; Assistant Professor of Biology, Clark College, 1913–.

SARA CAROLYN FISHER, PH.D., Chicago, Illinois

Honorary Fellow in Psychology and Research Assistant to Dr. Baird — 17½ Richards St.

A.B., Lombard College, 1909; A.M., University of Illinois, 1910; Fellow in Psychology, Clark University, 1910–13; Ph.D., 1913; Honorary Fellow, 1913–; Instructor in Psychology, Wellesley College, 1913–14.

JAMES EDMUND IVES, PH.D.

Honorary Fellow in Physics — 1030 Main St.

Assistant Curator, Academy of Natural Sciences, Philadelphia, 1887–93; Instructor in Physics, Drexel Institute, 1893–97; Jessup Student, Academy of Natural Sciences, Philadelphia, 1887–91; Student in Histology and Embryology, University of Pennsylvania, 1888–89; Student in Mathematics, 1893–95; Student in Physics, Cavendish Laboratory, Cambridge, England, 1896; Scholar in Physics, Clark University, 1897–98; Fellow, 1898–1901; Ph.D., 1901; Instructor in Physics, University of Cincinnati, 1901–03; Assistant Professor, 1905–10; Associate Professor, 1910–12; Honorary Fellow in Physics, Clark University, 1912–.

CAREY EYSTER MELVILLE, A.B.

Honorary Fellow in Mathematics — 3 Ferdinand St.

A.B., Northwestern University, 1901; Fellow in Mathematics, 1901–02; Graduate Student in Mathematics, Johns Hopkins University, 1902–03; Instructor in Mathematics, Case School of Applied Science, 1903–06; Honorary Fellow in Mathematics, Clark University, 1906–; Assistant in Mathematics, Clark College, 1906–09; Instructor, 1909–10; Instructor in Mathematics and Physics, 1910–11; Assistant Professor, 1911–.

MARY ELIZABETH MORSE, M.D.

Honorary Fellow in Psychology — 338 Plantation St.

A.B., Goucher College, 1899; M.D., Johns Hopkins University, 1903; Assistant Pathologist, Worcester State Hospital, January, 1913–; Student in Psychology, Clark University, 1913–14.

FRANK K. SECHRIST, PH.D.

Honorary Fellow in Psychology and Lecturer in the Children's Institute — 5 Lowell St.

Ph.B., Lafayette College, 1892; Professor of English, State Normal School, Lock Haven, Pa., 1892–99; Graduate Student, Lafayette College, 1893–98; Ph.D., 1898; Professor of Psychology and Pedagogy, State Normal School, Lock Haven, Pa., 1899–1900; Professor of English, State Normal School, Stevens Point, Wis., 1900–10; University of Jena, 1907; Head of Department of English and Modern Languages, and Professor of Psychology and Education, Rhode Island State College, 1910–12; Graduate Student, Harvard University, 1911; Honorary Fellow in Psychology, Clark University, 1912–; Ph. D., 1913.

REYNOLD ALBRECHT SPAETH, PH.D.

Honorary Fellow in Biology — 7 Ferdinand St.

B.S., Haverford College, 1909; Assistant in Elementary Zoölogy, Harvard University, and Assistant in Comparative Anatomy, Radcliffe College, 1910–11; A.M., Harvard University, 1911; Austin Teaching Fellow in Zoölogy, 1911–12; Francis Parkman Fellow, 1912–13; Ph.D., 1913; Traveling Fellow, 1913–14; Instructor in Zoölogy, Clark College, 1914–.

FELLOWS

LAWRENCE AUGUSTUS AVERILL, A.M., Wiscasset, Maine

Fellow in Pedagogy — 29 Abbott St.

A.B., Clark College, 1913; Assistant in German, 1912–13; Instructor, 1913–14; Scholar in Pedagogy, Clark University, 1913–14; A.M., 1914.

SETRAK KRIKOR BOYAJIAN, A.M., Madison, Wisconsin

Fellow in Psychology — 50 Franklin St.

Student, Euphrates College, 1903–06; University of Wisconsin, 1910–13; Scholar in History, Clark University, 1913–14; A.M., 1914.

CHARLES LEWIS BRIGHTMAN, A.M.

Fellow in Physics — 6 Downing St.

Ph B., Brown University, 1909; A.M., 1909; Assistant in Physics, Wesleyan University, 1909–10; Instructor in Physics, Mount Holyoke College, 1910–13; Fellow in Physics, Clark University, 1913–.

IVY GERTRUDE CAMPBELL, PH.D., Wellesley

Fellow in Psychology

A.B., University of Colorado, 1911; Scholar in Psychology, Clark University, 1911–12; A.M., 1912; Fellow in Psychology, 1912–; Ph.D., 1914; Lecturer and Assistant in Psychology, Wellesley College, 1914–.

Louis David Covitt, A.B., Lexington, Kentucky
Fellow in Psychology — 12 Oberlin St.

A.B., Kentucky State University, 1913.

Harold Randolph Crosland, A.M., Orangeburg, South Carolina
Fellow in Psychology — 815 Main St.

A.B., University of South Carolina, 1913; Fellow in Psychology, Clark University, 1913–; A.M., 1914.

Leo Henry Dawson, A.M., Medfield
Fellow in Chemistry — 14 Kenwood Ave.

A.B., Clark College, 1912; Scholar in Chemistry, Clark University, 1913–14; A.M., 1914.

William Learned Dealey, A.M., Providence, Rhode Island
Fellow in Psychology — 17½ Richards St.

A.B., Brown University, 1913; A.M., 1913; Fellow in Psychology, Clark University, February 1913–.

Burchard Woodson DeBusk, A.B.
Fellow in Psychology — 101 May St.

B.S., Central Normal College, 1898; A.B., University of Indiana, 1904; Professor of Psychology and Education, Southwestern College, Winfield, Kansas, 1904–08; Acting Instructor and Director of Experimental Laboratory, University of Indiana, 1908–09; Fellow in Psychology, Clark University, 1909–10; Assistant Professor of Psychology, State Teachers College, Greeley, Colo., 1910–11; Associate Professor, 1911–14.

Robert Newton Elliott, A.B., Emory, Virginia
Fellow in Pedagogy — 52 May St.

A.B., Emory and Henry College, 1910.

Rutherford Erwin Gleason, A.B.
Fellow in Mathematics — 941 Main St.

A.B., Stanford University, 1914.

Essie Maud Greisheimer, B.S. in E., Chillicothe, Ohio
Fellow in Biology — 52 May St.

B.S. in E., Ohio University, 1914.

ARTHUR OLIN GRIGGS, PH.B., Westford, Connecticut
Fellow in Pedagogy — 19 Kilby St.

Ph.B., Wesleyan University, 1898; Professor of Mathematics, Virginia Union University, 1903–05; Scholar in Pedagogy, Clark University, 1906–07; 1910–11; Fellow, 1911–12; Student, 1912–13.

ELMER ADNA HARRINGTON, A.M., Winchendon
Fellow in Physics — 46 May St.

A.B., Clark College, 1905; Scholar in Physics, Clark University, 1905–06; A.M., 1906; Fellow, 1906–07; 1908–09; Student in Physics, University of Berlin, 1907–08; Instructor in Physics, Williams College, 1909–12; Instructor in Physics, Smith College, 1912–14.

BAITEN HORI, A.M., Tokyo, Japan
Fellow in Psychology — 91 Lovell St.

Graduate, Keiogijuku University, Tokyo, Japan, 1911; Scholar in Psychology, Clark University, 1912–13; Fellow, 1913–; A.M., 1914.

GEORGE ELLIS JONES, A.M., Centerville, Iowa
Fellow in Pedagogy — 145 Woodland St.

A.B., Kansas State Normal School, 1909; Scholar in Pedagogy, Clark University, 1912–13; A.M., 1913; Fellow, 1913–.

YOSHIHIDE KUBO, Tokyo, Japan
Fellow in Psychology — 3 Ferdinand St.

Graduate, Imperial University, Tokyo, Japan, 1909; Student in University Hall, Tokyo, Japan, 1910–12; Fellow in Psychology, Clark University, 1913–.

PEYSAH LEYZERAH
Fellow in Mathematics — 71 Penn Ave.

Graduate, Dinaburg Real Gymnasium, 1911; Student in Mathematics, Clark University, 1912–13; Fellow, 1913–.

THOMAS JUSTIN LIBBIN, A.B., Maywood, Illinois
Fellow in Psychology — 2 Oliver St.

A.B., Stanford University, 1909; Graduate Student, University of California, 1909–10; University of Chicago, 1910–11.

CHARLES EDWARD MCCORKLE, PH.B., Dawson, Ohio
Fellow in Psychology — 28 Hollywood St.

Ph.B., Ohio University, 1909.

Clarence McCormick, A.M., Arkansas City, Kansas
Fellow in Mathematics — 17 Charlotte St.

A.B., University of Kansas, 1913; Fellow in Mathematics, Clark University, 1913–; A.M., 1914.

Florence Mateer, A.M., Paoli, Pennsylvania
Fellow in Psychology — 23 Maywood St.

Graduate, State Normal School, West Chester, Pa., 1906; Student, University of Pennsylvania, 1912–13; Research Assistant in Psychological Laboratory of the Vineland Training School, 1911–13; Scholar in Psychology, Clark University, 1913–14; A.M., 1914.

Maurice Walter Meyerhardt
Fellow in Psychology — 5 Clayton St.

Student at Koelnisches Gymnasium, Berlin, 1880–87; Student in Psychology, Clark University, 1903–04; 1911–12; Scholar, 1904–07; Fellow, 1907–09; Honorary Fellow, 1909–11.

Early Wesley Moore, A.B., Gate City, Virginia
Fellow in Pedagogy — 101 May St.

A.B., Emory and Henry College, 1914.

Francis John O'Brien, A.M.
Fellow in Psychology — 69 East Central St.

A.B., Holy Cross College, 1912; Scholar in Psychology, Clark University, 1912–13; A.M., 1913; Fellow, 1913–.

Willard Louis Osborn, A.B.
Fellow in Mathematics — 9 Ferdinand St.

A.B., Clark College, 1906; Instructor in Physics and Mathematics, Hobart and William Smith Colleges, 1910–14.

Edward Bates Peck, M.S., Spencer
Fellow in Chemistry — 31 Stoneland Road

Ph.B., Brown University, 1912; Assistant in Chemistry, Worcester Polytechnic Institute, 1912–13; M.S., Massachusetts Institute of Technology, 1914.

Bruce Bowman Robinson, A.B., Tulsa, Oklahoma
Fellow in Psychology — 2 Ripley Place

A.B., Baker University, 1914.

Samuel Pinckney Schneider, A.B., Lexington, South Carolina
Fellow in Psychology 5 May St.

A.B., University of South Carolina, 1914.

Frederick Madison Smith, A.M., Independence, Missouri
Fellow in Psychology 8 Wells St.

B.S., Graceland College, 1898; Professor of Mathematics, 1899–1900; A.M., University of Kansas, 1911.

George Samuel Snoddy, A.M., Emporia, Kansas
Fellow in Psychology 9 Silver St.

A.B., University of Kansas, 1912; B.S., 1912; A.M., 1913; Assistant Instructor in Educational Psychology, 1912–13; Fellow in Psychology, Clark University, 1913–.

Harold Frederic Stimson, A.M., Rochdale
Fellow in Physics and Research Assistant to Dr. Webster
8 Loudon St.

A.B., Clark College, 1910; Scholar in Physics, Clark University, 1910–11; A.M., 1911; Fellow in Physics and Research Assistant to Dr. Webster, 1911–.

Robert Brown Teachout, A.M., South Lancaster
Fellow in Psychology

A.B., Dartmouth College, 1914; A.M., 1914.

Mary Treudley, A.M., Athens, Ohio
Fellow in History 46 May St.

A.B., Ohio University, 1906; A.M., University of Chicago, 1910; Instructor in Latin and History, Vincennes University, 1911–13.

Raymond Holder Wheeler, A.M., Berlin
Fellow in Psychology and Research Assistant to Dr. Baird
9 Silver St.

A.B., Clark College, 1912; Assistant in Psychology, 1912–13; Scholar in Psychology, Clark University, 1912–13; A.M., 1913; Fellow and Research Assistant to Dr. Baird, 1913–.

Edward Clinton Wilson, A.B., Knoxville, Tennessee
Fellow in Psychology 101 May St.

A.B., Milligan College, 1887; Student in Psychology, Clark University, November 11–December 18, 1912; Fellow, 1913–.

Honorary Scholars

Charles Bernard Lewis, M.D.
Honorary Scholar in Pedagogy — 29 Tirrell St.

M.D., Tufts Medical College, 1909; Physical Director, Allegheny College, 1902–05; Tufts College, 1905–09; Scholar in Pedagogy, Clark University, 1913–.

Angelina L. Weeks, A.B., Springfield
Honorary Scholar in Pedagogy

A.B., Mt. Holyoke College, 1894; Graduate Student, Massachusetts Institute of Technology, 1901–02; Professor of Biology and Chemistry, American College for Girls, Constantinople, Turkey, 1906–07.

Scholars

Vernon Charles Allison, A.B., Pittsburg, Kansas
Scholar in Chemistry — 938 Main St.

A.B., State Manual Training Normal School, Pittsburg, Kansas, 1914.

Adelbert Ames, Jr., LL.B., Tewksbury, Massachusetts
Scholar in Psychology — 6 King St.

A.B., Harvard University, 1903; LL.B., Harvard Law School, 1906.

John Egbert Bishop, A.B., Forest Grove, Oregon
Scholar in Chemistry — 84 Woodland St.

A.B., Pacific University, 1914.

Ethel Bowman, A.M. — 767 Main St.
Scholar in Psychology

A.B., Wellesley College, 1900; Graduate Assistant in Psychology, 1904–05; A.M., 1907; Assistant, 1910–12; Instructor, 1912–14.

Robert Irving Bramhall, A.M., Holden
Scholar in History

A.B., Clark College, 1905; Scholar in History, Clark University, 1905–07; A.M., 1906; Assistant in History, Clark College, 1905–Feb., 1908.

Earl Van Dusen Burdick, A.M.
Scholar in Psychology — 33 Queen St.

A.B., Colgate University, 1911; Instructor in French and German, Worcester Polytechnic Institute, 1911–; Student in Psychology, Clark University, 1911–14; A.M., 1914.

Manmath Nath Chatterjee, Bengal, India
Scholar in History — 15 Richards St.

Student, Punjub University, India, 1906–08; University of Glasgow, 1908–12.

Herbert Kimball Cummings, B.S., West Boylston
Scholar in Physics

B.S., Worcester Polytechnic Institute, 1910; Instructor in Physics and Chemistry, Alfred University, 1910–11; Instructor in Physics, Worcester Polytechnic Institute, 1911–; Student in Physics, Clark University, 1911–13; Scholar, 1913–.

Edward Henry Darby, A.B.
Scholar in Chemistry — 5 Holland Road

A.B., Clark College, 1914.

Lorey Clifford Day, A.B., Baldwinville
Scholar in Psychology — 65 Downing St.

A.B., Clark College, 1913; Assistant in Psychology, 1914–.

Hermione Louise Dealey, Ph.B., Providence, Rhode Island
Scholar in Psychology — 17½ Richards St.

Ph.B., Brown University, 1914.

Wilbur Brooks Dexter, B.S.
Scholar in Chemistry — 7 West Oberlin St.

B.S., Colby College, 1914.

Aubrey Augustus Douglass, A.B., Emporia, Kansas
Scholar in Pedagogy — 28 Hollywood St.

A.B., Kansas State Normal School, 1912.

Joseph Kirk Folsom, B.S., Newark, New Jersey
Scholar in Economics and Sociology — 5 Clifton St.

B.S., Rutgers College, 1913; Instructor in Physics, St. Lawrence University, March-June, 1914.

Charles Herbert Huffman, A.B., Bridgewater, Virginia
Scholar in History — 37 Clifton St.

A.B., Bridgewater College, 1914.

Chimaki Kageyama, Suruga, Japan
Scholar in Pedagogy — 90 Florence St.

Graduate, Waseda University, Tokyo, Japan, 1905; Student, Ohio State University, 1907–08; Special Student, Boston University, 1908–10; Scholar in Psychology, Clark University, 1913–.

GUSTAF ALBERT LUNDGREN, A.B.
Scholar in Biology — 191 Vernon St.

A.B., Clark College, 1914; Assistant in Biology, 1914–.

JOHN CORNELIUS O'BRIEN, A.B., Windsor, Connecticut
Scholar in History — 65 Downing St.

A.B., Clark College, 1914; Assistant in History, 1914–.

SAMUEL JAMES PLIMPTON, PH.D.
Scholar in Physics — 2 Trowbridge Road

Ph.B., Sheffield Scientific School, 1905; Ph.D., Yale University, 1912; Instructor in Physics, Yale College, 1912–13; Johns Hopkins University, 1913–14; Worcester Polytechnic Institute, 1914–.

GEORGE ALBERT PROHASKA, A.B.
Scholar in Pedagogy — 118 Belmont St.

A.B., Holy Cross College, 1912; Scholar in Psychology, Clark University, 1912–13.

VANCE RANDOLPH, A.B., Pittsburg, Kansas
Scholar in Psychology — 7 Woodbine St.

A.B., State Manual Training Normal School, Pittsburg, Kansas, 1914.

WINIFRED V. RICHMOND, B.S. in E., Athens, Ohio
Scholar in Pedagogy — 46 May St.

B.S. in E., Ohio University, 1910.

ANCEL ST. JOHN, PH.B.
Scholar in Physics — 53 Queen St.

Ph.B., University of Rochester, 1906; Instructor in Physics, Syrian Protestant College Beirut, Syria, 1906–09; Assistant in Physics, Columbia University, 1909–10; Acting Professor of Physics, Emory and Henry College, 1910–12; Instructor in Physics, Worcester Polytechnic Institute, 1912–; Student in Physics, Clark University, 1912–13; Scholar in Physics, 1913–.

CHARLES BUNSEN SHAW, A.B., Torrington, Connecticut
Scholar in Pedagogy — 10 Woodland St.

A.B., Clark College, 1914.

JOSEPH TALAMO, A.B.
Scholar in Economics and Sociology — 102 Providence St.

A.B., Clark College, 1914; Assistant in Economics, 1914–.

ADRIAN THOMAS, B.S., Richmond, Virginia
Scholar in Biology — 23 King St.
B.S., Richmond College, 1914.

LOUIS THOMPSON, B.S., South Haven, Michigan
Scholar in Physics — 6 Shirley St.
B.S., Kalamazoo College, 1914.

JOHN THOMAS WARD, A.B., Springfield
Scholar in Chemistry — 65 Downing St.
A.B., Clark College, 1914; Assistant in Chemistry, 1914–.

CARL MILTON WHITE, A.B., Oxford
Scholar in Economics and Sociology
A.B., Clark College, 1913.

SAMUEL ZELDIN
Scholar in Mathematics — 17 Vale St.
Graduate, Real Gymnasia, Orsha, Russia, 1913; Scholar in Mathematics, Clark University, February, 1914–.

OTHER STUDENTS

MARY HARTWELL BURDETT, A.B., Leominster
Student in Pedagogy
A.B., Wellesley College, 1913.

CARL WILLIAM CARLSON, B.D.
Student in Psychology — 3 Olin St.
A.B., Bethany College, 1910; B.D., Augustana Theological Seminary, 1913.

FREDERICK EDSON CLERK, PH.B., Clinton
Student in Pedagogy
Ph.B., Yale University, 1903.

CORA BELLE DREW, Burlington, Vermont
Student in History — 5 High St.

FRANCIS LEE DUNHAM, M.D., Brookline
Student in Psychology
A.B., University of Vermont, 1894; M.D., 1897; Graduate Student, Columbia University, 1897–98; Student in Psychology, Clark University, March, 1913–; Student in Neurology and Psychology, Harvard University, 1914–15.

NONA ETHEL FINES GRIMLEY
Student in Psychology — 10 Edward St.

MAE ELEANOR GUERIN, A.B.
Student in History — 34 Shaffner St.

A.B., Middlebury College, 1914.

WILLIAM HENRY HAYES, A.B., Oxford
Student in Psychology

A.B., Wesleyan University, 1895; Student, Yale Divinity School, 1898–1901; Student in Psychology, Clark University, 1912–.

MAUDE ESTELLE MCMAHON, A.B.
Student in Pedagogy — 122 Woodland St.

A.B., Trinity College, 1914; Student in Pedagogy, Clark University, Septembe 24–December 23, 1914.

CORA ESTELLE MORSE, Malden
Student in Pedagogy — 4 Downing St.

Graduate, State Normal School, Framingham, Mass., 1908; Student, University of Pennsylvania, 1912–13.

EMELYN NEWCOMB PARTRIDGE
Student in Pedagogy — 2 Downing St.

Student in Anthropology, Clark University, 1913–14.

CARL LISLE PERCY, A.M., Charlton
Student in Pedagogy

A.B., Middlebury College, 1907; Instructor in English, Atlanta Theological Seminary, 1909–11; B.D., 1911; Student in Sociology, Clark University, 1911–13; A.M., 1913.

GREN OREN PIERREL, B.S.
Student in History — 53 Queen St.

B.S., Penn College, 1913.

GRACE WOODBURY REDDING, A.B.
Student in Economics and Sociology — 38 Woodland St.

A.B., Smith College, 1912.

Gertrude Pauline Smith, A.B.
Student in Pedagogy 276 Millbury St.

A.B., Trinity College, 1914.

Edith Rogers Spaulding, M.D., South Framingham
Student in Psychology

M.D., Tufts College Medical School, 1909; Resident Physician, Reformatory for Women, South Framingham, Mass., February, 1913–.

Alfred T. Ware, A.B., West Berlin
Student in History

A.B., Penn College, 1892

Attendants upon Saturday Courses

Lester F. Alden, Sterling
Gladys Copp, Oxford
James F. Leary, Worcester
Elisabeth M. Lincoln, Leominster
Mary A. Lincoln, Leominster
John J. A. Nugent, Worcester
Lucy A. Osborne, Worcester
Fordyce T. Reynolds, Gardner
Katharine C. Shapleigh, Worcester

Attendants upon Children's Institute Lectures

Ruth M. Adams
Lavinia C. Carpenter
Frances E. Craffey
Mary A. Drake
Katherine L. Edwards
Annie E. Fales
Mattie L. Fisher
E. W. Foskett
Alice C. Gilmore
Maude A. Gilmore
Elsie A. Hastings
H. F. Houghton
Josephine V. Kane
Daniel J. Marshall
Edith H. Moore
Sadie A. Murphy
Luvern G. Myers
Caroline E. Newell
Grace E. Oliver
Katherine P. Reddy
Marion G. Sherman
Ruth L. Smith
Charles A. Sparrow
Marguerite B. Sparrow
Elise S. Topanelian
May D. Williamson
Blanche N. Winter

Joseph Twichell Lansing John Joseph Rourke

Florence Chandler Bursar, and Clerk of the University	938 Main St.
Elizabeth Anna Felt Assistant in the Bursar's office	19 Bowdoin St.
Mary Evelyn Fitzsimmons, S.B. Private Secretary to the President	48 Downing St.

Instructors	21
Fellows, Scholars and Students	95
Saturday Courses	9
Children's Institute Lectures	27
Undergraduates	2
Total	154

ADMINISTRATION

The trustees are the ultimate source of authority in all matters pertaining to the University. They act collectively, through committees, and also through the President of the University.

Duties of the President of the University

The duties of this office were defined by the Trustees, May 23, 1889, as follows:

The President of the University shall consult frequently with the Trustees on all matters that concern the welfare of the University, and attend the meetings of the Board. He shall confer with each instructor concerning the development of his department, determine the duties and authority of each, and preside at the meetings of the Faculty. He shall be the authorized medium of communication between the Board of Trustees and the officers of instruction, individually and collectively, in all matters involving the administration of the University. The enactments of the Board concerning instructors and their work, and all requests, complaints and proposals from the Faculty to the Trustees shall be made known through him. He shall exercise or provide such superintendence over buildings, apparatus, books and other property, as will secure their protection and appropriate use. Expenditures must not be ordered by any instructor of the University without his previous consent or the express authority of the Board.

These duties were more fully defined by By-Laws enacted by the Corporation, Sept. 26, 1889. These are as follows:

BY-LAWS

1. The President of the University shall preside on all public academic occasions, shall direct the official correspondence, study the wants and interests of the whole University and exercise a general superintendence over all its concerns. His first care, and that of the authorities of the University, shall be the departments already established, and next those closely related to them; but no other department shall be established until those already introduced have been brought to the highest state of efficiency then possible. All acts, however, which shall involve the expenditure of money in the administration of the University's affairs, shall be subject to the approval of the Board of Trustees or the Finance Committee for the time being.

2. As the efficiency of a University depends chiefly upon the quality of its Faculty, the Board of Trustees will hold the President to a strict but reasonable accountability for the fidelity and ability of each instructor. The President only shall have the power to select and appoint all officers of instruction, subject to the approval of the Board of Trustees. To make wise and well-considered appointments, to maintain harmony within the Faculty, and to increase their efficiency in research and instruction shall be his most important duty. If at any time the President shall be negligent in the discharge of these or other duties, or is from any cause disabled from discharging them, they may be exercised by the Board of Trustees.

3. The President of the University shall be the medium of communication between the Trustees and Instructors, individually and collectively, upon all matters within the field of

action of either body. He shall attend all meetings of the Board of Trustees, of which he shall be notified, and shall participate in their deliberations, but without the power to vote. All complaints and requests from members of one body to the other shall be made through him.

4. The President shall call and preside over all official meetings of the Instructors, and a record of their proceedings shall be kept. These records are in no case to be made known to others than the Trustees. They shall always be in the custody of the President, but may be inspected by the Trustees, or either of them, at any time.

5. The President of the University, in the absence of the Trustees or Finance Committee, shall have the entire direction and control of the persons employed about the University and not engaged in the work of instruction; the duties of all such persons shall be assigned and they shall be appointed or removed by him, subject to the approval of the Finance Committee.

6. No instructor shall order any books or apparatus, or anything connected with the work of instruction (beyond his appropriation), without the approval of the President. No expense for the care of buildings or grounds, nor for alterations or repairs within and upon the same shall be made without the approval of the Board of Trustees or the Finance Committee, such alterations or repairs in no case to exceed the appropriations made for that purpose. If the Trustees, or Finance Committee,or any person, shall make contracts in behalf of the University without authority, the officer or person making such contract shall become individually responsible therefor.

7. The officers of instruction shall be appointed for a term of from one to five years. At the end of this period the work of each instructor will be subjected to a careful scrutiny upon the results of which his reappointment shall depend, always provided, however, that any Instructor will be liable to be dis-

charged at any time for incapacity, neglect of duty or for such other cause as shall seem good to the Trustees.

8. Each Instructor shall give stated lectures to however few. He shall actively and zealously strive to maintain the highest possible standard, shall work in a spirit of hearty sympathy and coöperation, and shall encourage research by precept and, if possible, by example.

9. The foregoing By-Laws are intended to embody the provisions contained in a vote passed by the corporation on the twenty-third day of May, A.D. 1889, upon the motion of Judge Devens. (See above.) If at any time hereafter any discrepancy shall be found to exist between the two, said By-Laws shall be so far modified as to conform to the provisions of said vote.

10. No instructor shall engage in any outside professional or technical pursuit without the approval of the Board, the Finance Committee, or the President.

11. These By-Laws, or any one of them, may be changed, amended, or repealed by a vote of three-fourths at least of the Trustees at any meeting of their Board duly called, notified, and held for that purpose.

GENERAL STATEMENTS

The University now consists of eight departments, in which all its work and that of Instructors, Fellows and Scholars is grouped.

These departments are as follows:

I. Mathematics
II. Physics
III. Chemistry
IV. Biology
V. Psychology
VI. Pedagogy
VII. Economics and Sociology
VIII. History

The Faculty

The Faculty elect Fellows and take action upon general requirements for the Doctor's and Master's degrees and other promotions, act and advise upon whatever may be officially submitted to them by the Board or by the President, and consider all matters not otherwise provided for and in which all departments of the University are alike interested.

Admission

Only graduate students or those of equivalent attainments are admitted to full membership in the University, except in rare and special cases.

At present no entrance examinations are required; but by testimonials, diplomas, personal interviews, or written specimens of work, the authorities must be satisfied that the applicants have scholarship enough to work to advantage, and zeal and ability enough to devote themselves to their chosen field. The methods of the University are too costly, and its energy and funds too precious, to be spent upon those who are not well trained, promising and in earnest.

It is highly desirable that candidates entering any of the eight departments shall have, beside a knowledge of the other subjects commonly taught in colleges, a reading knowledge of French and German.

For the select students who are received, it is the purpose of the University to open all its privileges and to supply every incentive possible in the way of books, facilities, and, above all, direct personal stimulus. The chief as well as the best work of this University is individual and involves daily suggestion, encouragement and direction. The limited number of students permits more or less personal instruction in each case.

Classes of Appointees

No clearly marked line exists between students and instructors. Fellows who have attained some degree of mastery in a special line of work sometimes give brief special courses, which may be attended by professors.

This is a stimulus to the student, and both tests and exhibits power in teaching.

I. DOCENTS

The highest residential appointment not involving membership in the Faculty is that of Docent. These positions are designed for men of marked gifts and attainments who have at least attained the doctorate and wish to engage in research, teaching, or both.

Class A. Free Docents

Each docent of this class will be expected to deliver a limited number of lectures on some topic within his department. In so doing, he shall be entirely independent of other instructors both in his choice of special topic and his manner of treating it, and responsible only to the President of the University, by whom he shall be appointed after consultation with the head of the department. The free docent shall have command of the resources of the department in the way of books, apparatus, etc., so far as this does not interfere with its regular work. By establishing free docents, the Faculty desires not only to maintain and guarantee the fullest academic freedom, but to expose itself to all the stimulus that can come by the rivalry of younger or outside men, and to introduce new topics and new departures in old ones.

Class B. University Docents

A University docent shall engage in research and may collaborate with the head of the department or other

member of the Faculty and supplement his work. He shall be appointed by the head of the department with the approval of the President.

Habilitation of Docents

A docent of either class may prepare and read in public an habilitation address representing original work after a term of service of a length and under conditions to be determined by the Faculty for each individual case. Upon doing this, he may be formally presented with a certificate or diploma granting him the *venia docendi* or licentiate, which shall not be a title or degree, but shall attest his fitness as scholar or investigator for an academic position and shall be regarded by the University as a brevet collegiate professorship. The fee for such a certificate shall be $25, which the Faculty shall have power to remit. The compensation of a docent of either class, if any, shall be determined by the President, and the fees to be paid him by students, if any, shall be determined by the Bursar.

It is believed that the difficulties of college authorities in selecting suitable professors may be somewhat diminished by the existence of such a select body of scholars of guaranteed scientific training, ability, and approved power to teach, and that this new grade may aid in raising the standard of academic scholarship.

II. QUIZ MASTERS

Each member of the University Faculty may, with the approval of the President, appoint one or more quiz masters who with the aid of his lecture notes, or

otherwise, shall conduct review classes upon his lectures and who may hold preliminary tests, but who shall not lecture or give instruction save as review. These positions shall be regarded as honorary and as a privilege of more advanced students in perfecting their own knowledge and acquiring practice in instruction.

III. NON-RESIDENT LECTURERS

The representatives of each department may, with the approval of the President, bring eminent experts for exchange or other lectures of a special nature at any time during the academic year. They may also in return, with the approval of the President, give similar brief courses in other institutions, provided this does not interfere with their full efficiency for the work of this University.

IV. HONORARY FELLOWS

Those who have already advanced to the Doctor's degree may be appointed Honorary Fellows and given the privileges of the University, including those of the Library. In past years many who have already taken this degree, either in this country or abroad, and who are awaiting academic appointment, have found these positions both helpful for their own further research and development and also advantageous for obtaining the collegiate and university appointments that they seek.

V. CANDIDATES FOR THE DEGREE OF DOCTOR OF PHILOSOPHY

Candidates for the Doctor's degree must have previously taken the Degree of Bachelor of Arts or have had

a substantial equivalent for the training implied by that degree.

At least one year, but in most cases three years, of graduate work are necessary for this degree. Examinations for it, however, may be taken at any time during the academic year when, in the judgment of the University authorities, the candidate is prepared, provided the requirement of one year's residence has been absolved.

For this degree one requirement is a dissertation upon an approved subject, to which it must be an original contribution of value. To this capital importance is attached. It must be reported on in writing by the chief instructor before the examination, printed at the expense of the candidate, and at least one hundred copies given to the University. However, in case of a dissertation of unusual length, or containing expensive plates, the Faculty shall have power, at the request of the candidate, to reduce this number of presentation copies to fifty.

Such formal or informal tests as the Faculty may determine shall mark the acceptance of each student or Fellow as a candidate for this degree. One object of this preliminary test shall be to insure a good reading knowledge of French and German. Such formal candidature shall precede the examination itself by a period prescribed in the special rules below.

The fee for the Doctor's degree is $25, payable before the examination. The presentation copies of the dissertation must be in the hands of the Librarian before the diploma is delivered. In exceptional cases, and by special action of the Faculty, the act of promotion may precede the presentation of the printed copies of the dissertation.

An oral, but no written, examination is required upon at least one minor subject in addition to the major before an examining jury composed of at least four members, including the head of the department and the President of the University, who is authorized to invite any person from within or without the University to be present and to ask questions. The jury shall report the results of the examination to the Faculty, who will recommend satisfactory candidates for the degree.

For the bestowal of this degree, the approbation of the Board of Trustees must in each case be obtained by their signature upon the diploma. They desire that the standard of requirements for it be kept the highest practicable, that it be reserved for those of superior ability and attainment only, and that its value be never suffered to depreciate.

It is to the needs of candidates for this degree that the lectures, seminaries, laboratories, collections of books, apparatus, etc., are especially shaped, and no pains will be spared to afford them every needed stimulus and opportunity. It is for them that the Fellowships and Scholarships are primarily intended, although any of these honors may be awarded to others.

On November 14th, 1900, the following vote was passed by the Board of Trustees:

That the University will admit candidates for the degree of Doctor of Philosophy and will confer that degree without regard to sex.

Special Rules concerning the Doctor's Degree

I. *Residence.* No candidate shall receive the degree of Doctor of Philosophy without at least one academic year's previous residence.

II. *Candidature for the Doctor's Degree.* Every applicant for the Doctor's degree shall fill out, before October fifteenth, the regular application blank provided at the office. This schedule shall be submitted to the head of the department. Before affixing his signature he shall satisfy himself, in such manner as he may desire, as to the fitness of the applicant.

III. When countersigned, this schedule shall be filed with the President, and the applicant will be examined in French and German by the annual committee for that purpose.

IV. In case of a favorable report by this committee, the applicant shall be a regular candidate for the degree.

V. Candidates complying with all preliminary conditions, including the examinations in French and German, before November first will be allowed to proceed to the doctor's examination at any time between May fifteenth following and the end of the academic year.

VI. *The Doctor's Dissertation.* The dissertation must be presented to the instructor under whose direction it is written, and reported upon by him before the doctor's examination. In every case the dissertation shall be laid before the jury of examination, at the time of examination, in form suitable for publication. This provision shall not, however, preclude the making of such minor changes later as the chief instructor may approve.

VII. The dissertation shall be printed at the expense of the candidate and the required copies deposited with the Librarian within one calendar year after the first of October following the examination. The candidate alone will be held responsible for the fulfilment of these conditions.

VIII. The favorable report of the chief instructor, filed in writing with the Clerk of the University, shall be a sufficient imprimatur or authorization for printing as a dissertation. The printed copies shall bear upon the cover and title page the statement of approval in the following words, over the signature of the chief instructor:

> A Dissertation submitted to the Faculty of Clark University, Worcester, Mass., in partial fulfilment of the requirements for the degree of Doctor of Philosophy, and accepted on the recommendation of
>
> (NAME OF CHIEF INSTRUCTOR)

IX. *Examinations for the Doctor's Degree.* The examinations for the doctor's degree may be held at any time during the academic year, provided that at least one academic year has elapsed since the completion of the preliminaries of candidature, except in the case of fulfilment of these conditions between the beginning of any academic year and November first of that year, to which case Rule V applies. The examinations shall be held at such hours and places as the President may appoint.

X. Examinations may also be held during the regular vacations of the University, but for these an additional fee of five dollars to each examiner and the reasonable travelling expenses of any examiners who are out of town, all payable in advance, will be required.

VI. CANDIDATES FOR THE DEGREE OF MASTER OF ARTS

This degree is conferred upon candidates who comply with the following requirements:

1. The candidate shall have previously taken the degree of Bachelor of Arts, or have had a substantial

equivalent for the training implied by that degree, to be determined by special vote of the Faculty; but such degree or training must involve a good preparation for the work proposed for the Master's degree, in order that it may be accepted.

2. The candidate must devote a full academic year to post-graduate work in this University after receiving the Bachelor's degree or the training accepted as its equivalent. This work shall be mainly in one department, but the candidate may do also such other work as shall be advised by the head of his principal department —whose approval of the whole course shall be necessary. In particular cases, the candidate may be allowed, by special vote of the Faculty, to divide his work between two years; but the aggregate must, in all cases, amount to a full year's work, at least.

3. The candidate must satisfy the representatives of his principal department that he has done his work faithfully and has mastered the subjects involved, by such written and oral examinations and other tests as the department may require. The head of the department shall make a written report to the Faculty of the grounds on which the candidate is recommended, specifying the amount and character of his work, and this report shall be filed in the office.

4. The candidate must present a thesis or written report on some topic included in his course or closely related to it, that shall receive the approval of the representatives of his principal department, be accepted by the Faculty, and filed in the office.

5. Every candidate recommended for the Master's degree shall pay a fee of ten dollars.

6. The Master's degree will be conferred at the annual commencement in June of any year on those candidates only who shall have made written application to be considered as such on or before January 15th preceding and shall have fulfilled all the conditions here specified at least one week before Commencement, at which time the academic year shall be regarded as ending for the purposes of section 2.

VII. SPECIAL STUDENTS NOT CANDIDATES FOR A DEGREE

Any one desiring to undertake a special and approved line of research, and whose attainments are such as to satisfy the requirements of the University, may also be received. This class includes persons who may desire to devote themselves exclusively to one or more of the special branches—mathematics, physics, chemistry, biology, psychology, pedagogy, economics and sociology, or history—but who do not care to matriculate or become candidates for a degree.

These students, provided they satisfy the heads of the departments of their training and competency in one subject, in which they must be advanced (although they may be less so, or even beginners, in other subjects), may be allowed entire freedom in their choice and combination of studies, and as special students may enjoy all the privileges of the University.

These students may, with the approval of the President, be received for less than an entire year.

VIII. PRELIMINARY CANDIDATES

Non-university students of less special or less advanced standing than the above classes, who contemplate becoming candidates for some higher degree, may also be received.

Students of this class must satisfy the authorities of the University of their attainments and that they contemplate advancing to a degree higher than that of A.B. The privileges and status of these students will be more fully defined later. They may, in exceptional cases, be elected to Scholarships.

Fellowships and Scholarships

From the George F. Hoar Fund of $100,000 provided by the generosity of Andrew Carnegie, the sum of $3,000 is now available for Junior and Senior Fellowships in the University. While the sums attached to these appointments are not fixed, a Senior Fellow may receive $200 together with the remission of fees; which makes the value of the appointment $300. A Junior Fellow may receive $100 with remission of fees, which makes the value of the appointment $200. Besides these, other appointments of Senior and Junior University Scholarships, with remission of fees, are made.

A citizen's fund

A citizen of Worcester has given a fund of $5,000, the income of which is to be used for the aid of "some one or more worthy native born citizens of the city of Worcester who may desire to avail themselves of the advantages of the institution."

THE FIELD FUND

Mrs. Eliza W. Field has also given $500 to be called the "John White Field Fund," the income of which is "to provide for the minor needs of a Scholar or Fellow."

The following regulations apply to the award of the income of the Field Fund:

1. Regard is had to the intellectual ability of the candidate as well as to need of pecuniary assistance.

2. Only candidates who have spent three months at the University are considered.

3. The head of each department will consider and report to the Faculty desirable cases in his department.

4. Applications are received not later than December 15th, and the awards made as soon as possible after the Christmas recess.

THE ELIZA D. DODGE FUND

Mrs. Dodge has given $1,000 to be known as the "Eliza D. Dodge Fund," the income only to be expended in aid of graduate students of limited means engaged in research work.

PURPOSE AND CONDITIONS OF FELLOWSHIPS AND SCHOLARSHIPS

Fellowships at Clark University are intended for young men and women of promise who desire to pursue post-graduate studies in order to fit themselves for intellectual careers. It is desirable, but not required, that candidates for these positions should intend to proceed to the degree of Doctor of Philosophy or to equivalent attainments. In general, those intending to devote themselves to some

special branch of learning are preferred to those directly fitting themselves for one of the three learned professions, although the latter are not excluded.

No application blanks are provided, but it is desired that the candidate should state fully and in writing his previous course of study and submit testimonials or diplomas, especially such as indicate a decided preference for some particular department. These should be accompanied also, if practicable, by some specimen of the candidate's work. Applications will be considered in May and in October and should be in the hands of the President on or before the first day of either month. In special cases vacancies may be filled by appointments at any time during the year. The names of unsuccessful candidates will not be made public.

Fellows must reside in Worcester during the entire academic year, devote themselves to special studies under the direction of their instructors, and give such evidence of progress or proficiency before the end of the year as the authorities shall require. It is generally expected that they will undertake some work of research during the year. They must coöperate in promoting harmony, order, and all the ends of the University, must not teach elsewhere, and may be reappointed at the end of the year. Being intended primarily as honors, both Fellowships and Scholarships are awarded without reference to pecuniary needs, so that those Fellows able and desiring to do so may relinquish the emolument and retain the title.

The paying fellowships will, for the present, be restricted to the departments of mathematics, physics, chemistry, biology, psychology, pedagogy and history.

Besides field work, excursions to institutions (public and private), coaching and cram classes, clubs, examinations, and other modes by which knowledge now seems best imparted and retained, the following educational methods are prominent:

Lectures. The Trustees desire that each instructor, of however few students, should prepare and deliver regular lecture courses, with diagrams, illustrative apparatus, and reference to standard text-books and the best current literature upon each topic. Advanced students are also encouraged to supplement the work of the professors by giving occasional special lectures and courses. Public lectures will be given from time to time.

Seminaries and Conferences. These are stated meetings for joint systematic work, under the personal direction of the professor, in some special part of his subject. Here students preparing theses and papers for publication in the journals edited at the University read them in incomplete form for mutual criticism and help. Here, also, the results of individual reading are reported for the benefit of all; views are freely criticised; new inquiries, methods, comparisons, standpoints, etc., suggested. From the mutual stimulus thus given many important works have proceeded and the efficiency of universities has been greatly increased.

Laboratory Work. For beginners this has been from the first the best of all forms of apprenticeship, bringing student and professor to a closer and mutually stimulating relation. Here the manipulation of apparatus is learned, processes are criticised, results obtained

by other investigators are tested, and methods discussed and perfected, with a view to developing that independence in research which is the consummation of scientific culture.

Notices

The charge for tuition, giving all the privileges of the University, but not covering the laboratory fees, is $100 per annum.

Board and lodging can be obtained near the University at very moderate rates.

Intending students will be given information, so far as possible, upon any of these or other points, in advance of official announcement, upon addressing the Clerk of the University, Miss Florence Chandler, Worcester, Mass.

All members of the University are expected to be present at the opening of each term and to continue in attendance to its close.

The following are the statements and announcements of the departments for the academic year, 1915–1916.

I. MATHEMATICS

Programme for 1915–1916

instruction in mathematics

The chief aim of the department is to make independent investigators of such students as have mathematical taste and ability; these naturally look forward to careers as teachers of the higher mathematics in colleges and universities, and we believe that the course of training best adapted to the development of investigators is also that which is most suitable for all who would be efficient college professors, even if they are not ambitious to engage in research. The first essential of success in either of these lines is the habit of mathematical thought, and the direct object of our instruction is the acquisition of this habit by each of our students. With this end in view, we expect every student to make himself familiar with the general methods and most salient results of a large number of different branches of mathematics, conversant with the detailed results and the literature of a few branches, and thorough master of at least one special topic to the extent of making a real contribution to our knowledge of that subject.

In accordance with these principles, the instruction is given by means of introductory, advanced and special courses of lectures, seminaries, and personal guidance in reading and investigation.

The introductory courses (mostly given in alternate years) treat the following subjects:

Analytic Geometry of Conics, Higher Plane Curves, Quadrics, Higher Surfaces, and Twisted Curves; 5 hours a week, through the year.

DIFFERENTIAL EQUATIONS, AND CALCULUS OF VARIATIONS; 5 hours a week, through the year.

THEORY OF FUNCTIONS OF REAL AND IMAGINARY VARIABLES, ELLIPTIC FUNCTIONS, AND DEFINITE INTEGRALS; 5 hours a week, through the year.

THEORY OF NUMBERS; 2 hours a week, one half-year.

HIGHER ALGEBRA; 5 hours a week, through the year.

ALGEBRAIC SUBSTITUTIONS AND THEIR APPLICATION TO THE THEORY OF EQUATIONS; 2 hours a week, one half-year.

ALGEBRAIC INVARIANTS; 2 hours a week, one half-year.

FINITE DIFFERENCES; 2 hours a week, one half-year.

It is expected that every student will take each course in the earliest year of his residence in which it is given, unless he has already completed an equivalent course elsewhere. The chief object of these courses is to make the student familiar with the various methods of mathematical research and the concepts of mathematical thought at the present day. Thus, for example, curves and surfaces are treated by modern methods from the beginning, with adequate consideration of the discoveries of the great geometers of recent times. The usual college courses in the theory of algebraic equations, analytic geometry, and the differential and integral calculus furnish all the necessary preparation for these introductory courses, although it is very desirable that the student be acquainted with the properties of determinants and their application to the solution of linear equations, and with the methods of solving differential equations of the simpler types. Deficiencies in these subjects may be made up by attendance on the corresponding courses in the Collegiate Department of the University.

Special advanced courses, open to all who are prepared for them, are given annually in subjects varying with the interests of the instructors and the needs of the students. These advanced courses are not repeated at regular intervals, but properly prepared students will receive the personal assistance of one or other of the instructors in reading any

subject not announced for the year in which they desire to take it.

The number and scope of the advanced courses given each year have been, thus far, regulated by the number of students qualified to profit by them and by the individual interests of the instructors; these courses will be increased, both in number and variety, whenever a real demand for such an increase shall make itself apparent. While the present purely scientific character of the University precludes instruction in strictly technical branches, we hope that the time is not far distant when the demand shall make it advisable, and increased facilities shall make it possible, to announce courses in Descriptive Geometry, Graphical Statics, Mathematical Astronomy, Vital Probabilities, and all the more important applications of mathematics to other sciences and to technical subjects. The applications of mathematics to physics already receive adequate consideration, and the further extension of such applications awaits only a demand for it on the part of students.

The subjects in which advanced courses may be expected to be given every few years include the following:

History of Mathematics.

Arithmetic: Numerical computations; Theory of numbers; Finite differences and the Calculus of operations; Probabilities and the Theory of errors.

Algebra: Substitution-groups and the Galois theory of equations; Invariants; Quadratic forms; Simultaneous equations (including Restricted systems); Multiple algebra.

Higher Analysis: Differential equations, ordinary and partial; Continuous groups; Definite integrals and Fourier's series.

Theory of Functions: Functions of real and complex variables; Point-aggregates; Elliptic functions; Abelian integrals.

Geometry: Modern synthetic geometry; Analytic geometry of higher plane curves, higher surfaces, and twisted curves; Rational and uniform transformations of curves and surfaces; Infinitesimal geometry; Analysis situs; Quaternions; Hyperspace and non-euclidean geometry.

Symbolic Logic.

Other courses will be given whenever there is a demand for them, as in the past. The instructors are always glad to assist students in any line of mathematics that falls within the range of their own studies. The small number of students makes it possible to give personal attention to individuals, and the intimate and confidential relation thus established between pupil and teacher is an advantage that cannot be overestimated and ought not to be left out of account by the prospective student in determining where his studies shall be pursued.

For the academic year 1915–16, the following courses of lectures are announced:

BY PROFESSOR STORY

Introductory Course:

CONTINUED FRACTIONS AND THEIR APPLICATIONS; 3 hours a week, through the year.

Advanced Courses:

HYPERSPACE AND NONEUCLIDEAN GEOMETRY; 3 hours a week through the year.

ALGEBRAIC INVARIANTS; 3 hours a week, first half-year.

DIFFERENTIAL GEOMETRY; 3 hours a week, second half-year

SEMINARY FOR ADVANCED STUDENTS; through the year.

BY PROFESSOR TABER

Introductory Course:

DIFFERENTIAL EQUATIONS AND CALCULUS OF VARIATIONS; 5 hours a week, through the year.

Advanced courses:

THEORY OF FINITE CONTINUOUS GROUPS; 2 hours a week, first half-year.

THEORY OF INTEGRAL EQUATIONS; 2 hours a week, second half-year.

SEMINARY; through the year.

BY PROFESSOR WEBSTER

[See announcement of Department of Physics, courses 10, 11, 13, 14.]

BY M. DE PEROTT

Introductory Courses:

THEORY OF NUMBERS; 2 hours a week, first half-year.

ALGEBRAIC SUBSTITUTIONS AND THEIR APPLICATION TO THE THEORY OF EQUATIONS; 2 hours a week, second half-year.

BY DR. WILLIAMS

Introductory Course:

DETERMINANTS AND THEORY OF EQUATIONS; 2 hours a week, through the year.

While desirous of supplying all possible facilities to those who wish to pursue studies in special branches, and to those who, already occupying permanent positions, have but a limited leave of absence, we have made it our chief object to provide a thorough training for those who, having just completed a college course, have not yet entered upon their life-work. This provision consists of such courses of lectures, seminaries, and individual assistance as should enable a faithful student endowed with the proper natural ability to satisfy the requirements for the degree of Doctor of Philosophy at the end of his third year with us. The requirements for this degree have been determined by our conception of the ideal teacher, as already stated. To acquire the necessary breadth of knowledge of mathematics as a whole, the candidate is expected to attend, during his first two years, specified introductory courses of lectures on the general principles, methods, and results of all the more important branches of pure mathematics, to supplement these lectures by private reading and to take an active part in the seminary. In the seminary, a special topic more or less directly connected with the subject of some lecture, is assigned, from time to time, to each student, who is required to read it up and make an oral report upon it before the class. Each candidate for the Doctor's

degree is expected to attend a number of advanced courses. He spends the greater part of his third year in the original investigation, under the constant personal guidance of one of the instructors, of a topic of his own selection. In preparing for this investigation he is required to make a practically complete bibliography of the subject and to read all the more important available articles that have been written on it. The results of the investigation, embodied in a dissertation suitable for printing, must be submitted to the instructor under whose direction the work was done, and must receive his approval before the candidate will be admitted to the final examination for the degree. This approval will not be given unless the dissertation is satisfactory in form and completeness and the results are sufficiently novel and important to constitute a real contribution to science. The dissertation is, in fact, the main criterion by which the candidate is judged, and no amount of other work will compensate for its defects.

Each of the instructors is engaged in research and has always a number of investigations planned for himself, which have often been carried to a well advanced stage but are not completed for want of time. Such incomplete investigations are given to properly prepared candidates for the Doctor's degree, and they receive from the instructor all the assistance necessary for the completion of the work, thus becoming, to a certain extent, collaborateurs with the instructor.

The preparation of a bibliography of any topic is greatly facilitated by a classified index of mathematical literature on the card-catalogue plan, which has been prepared under the supervision of Professor Story and now includes over one hundred thousand titles of periodical articles, separate memoirs, and books in all fields of pure mathematics. This index is much more complete than the Royal Society's

catalogue, even in the restricted field of that catalogue (periodicals published between 1800 and 1900), and will be extended as rapidly as possible.

The ability of our graduates to carry on research and the excellence of the work actually done is assured by the regulation that each dissertation accepted by us as worthy of the degree shall be printed with the explicit approval of a member of our Faculty. It is evident that, whereas any one that has the necessary preparation and taste for mathematics may profit by the advantages here afforded, only those who have a certain amount of mathematical genius can secure the degree.

In making appointments to fellowships and scholarships we have endeavored to maintain the same high standard. We are on the lookout for mathematical geniuses; but it is difficult to determine from the evidence of others whether candidates come up to our standard or not; so that we have adopted the general policy of giving the best appointments to those only that have been with us for at least one year, and about whom we are in position to judge for ourselves. Of course, this policy could not be carried out during the earlier years of the University, and its effect is apparent in the fact that, whereas seventy-five per cent of the students that entered the mathematical department during the first three years remained with us but one year, only thirty-three per cent. of those that have been admitted from 1892 to the present time left at the end of their first year. We do not mean to imply that those who left before completing our course were inferior in ability to those who remained three years, but we desire particularly to encourage men who can and will go forward to the degree.

Nearly all of those who have studied mathematics with us have adopted teaching as a profession, sixty-eight per cent are now members of college faculties, and thirteen per

cent are engaged in higher school work. Those who have received the doctor's degree have generally secured at once desirable positions in which to begin their life-work, and most of them have already acquired for themselves, by distinguished ability, very decided influence in the institutions with which they are connected.

The degree of Master of Arts will be conferred upon students who complete with credit an approved course of one year and present a satisfactory thesis.

Every facility for the study of special branches will be given to properly prepared students who are not candidates for a degree, as also to those who, having already attained to the Doctor's degree (here or elsewhere), wish to continue mathematical study or investigation.

Material Facilities

The library is provided with the more important text-books, treatises, and memoirs on the various branches of mathematics, as well as the principal journals and transactions of learned societies that are devoted to any considerable extent to mathematics. A list of these journals will be found below.

The mathematical department possesses a good collection of models, a Thomas arithmometer, and an Amsler planimeter with revolving table.

List of Journals Relating to the Exact Sciences in the University Library

Amsterdam.

Koninklijke akademie van wetenschappen. Verhandelingen, 1854 to date. Complete.

Revue semestrielle des publications mathématiques. 1893 to date. Complete.

Baltimore.

American chemical journal. 1879 to date. Complete.

American journal of mathematics. 1878 to date. Complete.

BANGKOK.

Siam society. Journal. 1905-07.

BERLIN.

Berliner mathematische Gesellschaft. Sitzungsberichte. 1902 to date. Complete.

Chemisches Centralblatt. 1897 to date. Complete.

Deutsche chemische Gesellschaft. Berichte. 1868 to date. Complete.

Fortschritte der Physik. 1847 to date. Complete.

Jahrbuch über die Fortschritte der Mathematik. 1868 to date. Complete.

Journal für die reine und angewandte Mathematik. 1826 to date. Complete.

Königlich-preussische Akademie der Wissenschaften. Mathematische und naturwissenschaftliche Mittheilungen aus den Sitzungsberichten. 1882-97. Complete.

Zeitschrift für angewandte Chemie. 1888 to date. Complete.

BOLOGNA.

Istituto di. Bologna. Reale academia delle scienze.

Commentarii. 1731-1791. Complete.

Novi commentarii. 1834-1849.

Memorie fis. e mat. 1806-1910.

Memorie. 1850 to date. Complete.

Scientia; rivista di scienza. 1910 to date. Complete.

BOSTON.

American academy of arts and sciences. Proceedings. 1870 to date. Complete.

North American Review. 1815–1886.

Technology review. 1899 to date. Complete.

BOULDER, COLORADO.

University of Colorado. Studies. 1902 to date. Complete.

BRAUNSCHWEIG.

Deutsche physikalische Gesellschaft. Berichte. 1903 to date. Complete.

Jahresbericht über die Fortschritte der Chemie. 1847 to date. Complete.

BRESLAU.

Kaiserlich-Leopoldinisch-carolinische deutsche Akademie der Naturforscher. 1843.

BRUXELLES.

Académie royale des sciences des lettres et des beaux-arts de Belgique.

Bulletins. Ser. 3. 1889 to date.

Mémoires couronnés et mémories des savants étrangers. 1889-90.

CAMBRIDGE, ENGLAND.

Cambridge philosophical society.

Proceedings. 1843 to date. Complete.

Transactions. 1822 to date. Complete.

CAMBRIDGE, MASSACHUSETTS.

Science. 1883 to date. Complete.

CHARLOTTESVILLE, VIRGINIA.

Annals of mathematics. 1884 to date. Complete.

CHICAGO.

Astrophysical journal. 1895 to date. Complete.

School science and mathematics. 1901 to date. Complete except vol. 13, Nos 1-2.

Terrestrial magnetism. 1896 to date. Complete.

COLUMBIA, MISSOURI.

University of Missouri studies. Science series. vol. 1. 1905-07.

DRESDEN.

Zeitschrift für Chemie und Industrie der Kolloide. 1906 to date. Complete

EASTON, PENNSYLVANIA.

American chemical society.

Chemical abstracts. 1907 to date. Complete.

Journal. 1879 to date. Complete.

Proceedings. 1878 to date. Complete.

Journal of industrial and engineering chemistry. 1909 to date. Complete.

EDINBURGH.

Edinburgh mathematical society. Proceedings. 1884-1907.

Edinburgh philosophical journal. 1819-1826.

Edinburgh royal society transactions. 1873 to date. Complete.

GÖTTINGEN.

Königliche Gesellschaft der Wissenschaften. Nachrichten von der k. Gesellschaft der Wissenschaften und der Georg-Augusts-universität. 1853 to date.

GREIFSWALD.

Archiv der Mathematik und Physik. 1901 to date.

HAARLEM.

Hollandsche maatschappij der wetenschappen. Archives néerlandaises des science exactes et naturelles. 1866 to date. Complete.

HALIFAX.

Nova Scotian institute of science.

Proceedings and transactions. Halifax. 1890 to date. Complete.

HALLE.

Zeitschrift für Electrochemie. 1895 to date. Complete.

HAMBURG.

Mathematische Gesellschaft. Mittheilungen. 1890 to date. Complete.

Zeitschrift für anorganische Chemie. 1892 to date. Complete.

HEIDELBERG.

Annalen der Chemie. 1832 to date. Complete.

INDIANAPOLIS.

Indiana academy of science. Proceedings. 1895-98.

ITHACA.

Journal of physical chemistry. 1896 to date. Complete.

LAWRENCE, KANSAS.

Kansas University science bulletin. 1902-1908.

LEIPZIG.

Acta Eruditorum, 1682-1731. 50 vols. Supplementa, 1692-1734. 10 vols. Indices generales, 1693-1733. 10 vols. in 5.

Nova Acta Eruditorum, 1732-1782. 13 vols. Supplementa, 1735-1739. 3 vols. in 2.

Annalen der Physik. 1824 to date. Beiblätter, 1889 to date. Complete.

Archiv für Optik. vol. 1. 1908.

Chemische Novitäten. 1905-08.

Deutsche Mathematiker-vereinigung. Jahresbericht. 1890 to date. Complete.

Encyklopädie der mathematischen Wissenschaften mit Einschluss ihrer Anwendungen.

Fortschritte der Chemie, Physik und physikalischen Chemie. 1909.

Internationale Mathematiker-congresse. Verhandlungen. 1897 to date. Complete.

Jahrbuch der drahtlosen Telegraphie und Telephonie. 1908 to date. Complete.

Jahresbericht über die Leistungen der chemischen Technologie. 1856 to date. Complete.

LEIPZIG (Continued).

Journal für praktische Chemie. 1834 to date. Complete.

Königlich-sächsische Gesellschaft der Wissenschaften.

Berichte über die Verhandlungen der mathematisch-physischen Classe. 1849 to date. Complete.

Abhandlungen der mathematisch-physischen Classe. 1852 to date. Complete.

Mathematische Annalen. 1869 to date. Complete.

Zeitschrift für Chemie. 1866-71.

Zeitschrift für Mathematik und Physik. 1856 to date. Complete.

Zeitschrift für physikalische Chemie. 1887 to date. Complete.

Zeitschrift für mathematische und naturwissenschaftliche Unterricht. 1903 to date.

Zeitschrift für wissenschaftliche Photographie, Photophysik und Photochemie. 1903 to date. Complete.

LIÈGE.

Société royale des sciences. Mémoires. 1843 to date. Complete.

LONDON.

British academy. Proceedings. 1905. 1907.

British association for the advancement of science. Reports. 1831 to date. Complete.

Chemical news and journal of physical science. 1904 to date. Complete.

Chemical society of London.

Annual reports on the progress of chemistry. 1905 to date. Complete.

Journal. 1849 to date. Complete.

Electrician. 1891 to date. Complete.

International catalogue of scientific literature. 1902 to date. Complete.

London mathematical society. Proceedings. 1865 to date. Complete.

Royal Society.

Proceedings. 1800 to date. Complete.

Philosophical transactions. 1665 to date. Complete.

Mathematical gazette. 1896 to date. Complete.

Nature. 1870 to date. Complete.

Nineteenth century. 1877 to date. Complete.

Philosophical magazine. 1798 to date. Complete.

Physical Society of London. 1876 to date. Complete.

Quarterly journal of pure and applied mathematics. 1857 to date. Complete.

Quarterly review. 1809-1885.

Science abstracts. 1898 to date. Complete.

Science progress in the 20th century. 1907 to date. Complete.

MADISON.

Wisconsin academy of arts and sciences. Transactions. 1898.

MANILA.

Philippine journal of science. 1906 to date. Complete.

MILANO.

Annali di matematica, pura ed applicata. 1889 to date.

Reale istituto lombardo di scienze e lettere. Classe di scienze mathematieech naturali.

Rendiconti. 1864-67. Complete.

Rendiconti. 1868 to date. Complete.

Memorie. 1843 to date. Complete.

MONTREAL.

Royal society of Canada. Proceedings and transactions. 1882-1906.

München.

Königlich bayerische Akademie der wissenschaften. Sitzungsberichte der mathematisch physikalischen Klasse. 1871 to date. Complete.

NEW HAVEN.

American journal of science and arts. 1871 to date. Complete.

NEW YORK.

American mathematical society.

Annual register. 1892 to date. Complete.

Bulletin. 1894 to date. Complete.

Transactions. 1900 to date. Complete.

American society of biological chemists. Proceedings. 1907 to date. Complete.

Appleton's journal of literature, science and art. 1869-76.

Electrical world and engineer. 1907 to date. Complete.

Journal of biological chemistry. 1905 to date. Complete.

The Minerva. 1824-26.

New York Mathematical Society. Bulletin. 1891-94. Complete.

Popular science monthly. 1872 to date. Complete.

Physical review. 1894 to date. Complete.

OXFORD.

Messenger of mathematics. 1862 to date. Complete.

PALERMO.

Circolo matematico di Palermo. Rendiconti. 1887 to date. Complete.

PARIS.

Annales de Chemie et de physique. 1789-1908.

Annales scientifiques de l'École normale supérieure. 1864 to date. Complete.

Association française pour l'advancement des Sciences. Comptes rendus des sessions. 1873 to date. Complete.

Bulletin des sciences mathématiques. 1870 to date. Complete.

Bureau international des poids et mesures. 1881 to date. Complete.

École polytechnique. Journal. 1794 to date. Complete.

Institut de France. Académie des sciences. Comptes rendus hebdomadaires des séances. 1835 to date. Complete.

Journal de mathématiques pures et appliquées. 1836 to date. Complete.

L'éclairage électrique. 1894-1907.

L'enseigmement mathématique. 1899 to date. Complete.

Nouvelles annales de mathématiques. 1842 to date. Complete.

Revue des deux mondes. 1908 to date. Complete.

Revue générale des sciences pures et appliquées. 1903 to date. Complete.

Revue scientifique. 1863 to date. Complete.

Société chimique de Paris. Bulletin. 1858 to date. Complete.

Société mathématique de France. Bulletin. 1873 to date. Complete.

ST. PETERSBURG.

Journal of physical chemistry. (Russian Text.) Chemical section and physical section. 1909 to date.

PHILADELPHIA.

Academy of natural sciences of Philadelphia. Proceedings. 1890 to date. Complete.

American electrochemical society. Transactions. 1902 to date. Complete.

Lippincott's magazine of literature, science and education. 1868-1881.

PISA.

Il Nuovo Cimento. 1891 to date. Complete.

ROME.

Reale accademia dei lincei. Atti. Rendiconti. etc. 1847 to date.

SACRAMENTO.

Lick observatory. Publications. 1887-1903.

SALEM, MASSACHUSETTS.

American Association for the advancement of science. Proceedings. 1848 to date. Complete.

SIDNEY.

Australasian association for the advancement of science. 1888 to date. Complete.

STOCKHOLM.

Acta mathematica. 1882 to date. Complete.

Arkiv för matematik, Astronomi och fysik. 1903 to date. Complete.

Bibliotheca mathematica. 1884 to date. Complete.

STRASSBURG.

Zeitschrift für physiologische Chemie. 1877 to date. Complete.

STUTTGART.

Jarhbuch der organischen Chemie. 1908 to date. Complete.

Sammlung Chemischer und chemisch-technischer Vorträge. 1896 to date. Complete.

TOKYO.

Journal of the College of Science of the Imperial University of Japan.

Mathematico-physical society. Proceedings (Tôkyô sûgakubuturigakkwai kizi). 2nd Ser. 1901 to date. Complete.

TOULOUSE.

Université de Toulouse. Faculté des sciences. Annales. 1887 to date. Complete.

URBANA, ILLINOIS.

University of Illinois. University studies. 1900-1908.

WASHINGTON, D. C.

National academy of sciences.

Biographical memoirs. 1877 to date. Complete.

Memoirs. 1883-1902.

Reports. 1883 to date. Complete.

U. S. Bureau of Standards. Bulletin. 1905 to date. Complete.

U. S. Naval observatory. Publications 1900-1903.

U. S. Naval observatory. Astronomical and meteorological observations. 1885-89.

WIESBADEN.

Zeitschrift für analytische Chemie. 1862 to date. Complete.

WIEN.

Kaiserliche Akademie der Wissenschaften.

Denkschirften; mathematisch-naturwissenschaftliche Classe. 1850-1908.

Sitzungsberichte der mathematisch-naturwissenschaftlichen Classe. 1848 to date. Complete.

Monatshefte für Mathematik u. Physik. 1908.

Monatshefte für Chemie und verwandte Theile anderer Wissenschaften. 1881 to date. Complete.

WORCESTER.

The Mathematical review. 1896–97.

II. PHYSICS

The Department of Physics of Clark University is exclusively a department for graduate study and research in pure and applied physics. In order to set forth to the intending student the facilities of this department, stress may be laid on a number of points in which it is believed that the conditions here are exceptional.

First, the fact that the attention of the professor is not distracted from the needs of the student by other duties, which, combined with the small number of students in the department, enables an amount of personal attention to be given to each one which is perhaps unique in this country. The head of the department is able to see each student and to give him personal advice in the conduct of his researches or his studies every day if necessary. The facilities without which no graduate department of research in physics can be complete are comprised under three heads: first, a systematic course of lectures in theoretical or mathematical physics; second, a laboratory with a sufficient number of rooms for individual work and with a sufficient equipment of apparatus and an instrument shop for the speedy production of whatever may be necessary for the research in hand; third, a library containing the classic works on physics, with full sets of journals and proceedings of learned societies by which the history of progress, past and present, may be studied, and kept up-to-date by the continual purchase of the latest works. In all these directions the facilities offered by this department invite attention.

The lecture courses are so arranged as to cover in a cycle

of two years all the principal subjects and methods of theoretical physics. The pursuit of them will fit the student to read and study with facility any memoirs on mathematical physics. The courses are so arranged that, although they follow in order, it is possible for a student to begin in either year of the cycle. The regular courses are those not marked with a star, and constitute a course of from five to seven hours weekly. The starred courses are delivered at irregular intervals, according to the demands or the presence of students of sufficient advancement.

LECTURES

1. Dynamics. General Principles, Equations of Lagrange and Hamilton, Methods of Hamilton and Jacobi, Systems of Particles, Rigid Bodies.

This course is fundamental for the pursuit of all the others, and includes a detailed account of the principle of Least Action and the differential equations of Lagrange, preparatory to their application to other parts of mathematical physics such as optics and electricity.

2. Newtonian and Logarithmic Potential Functions, Attraction of Ellipsoids.

This course is a necessary preliminary to the study of electricity and magnetism, of hydrodynamics, and of the figure of the earth.

3. Elasticity, Hydrodynamics, Wave and Vortex Motion, Dynamical Basis of Sound and Light.

This course is the basis of applications of the theory of wave motion to sound, light, electro-magnetism, and earthquake waves, and to the study of meteorology.

3a. * Dynamics of Cyclic and Oscillatory Systems, with Applications to the Theory of Electricity, Sound and Light.

The substance of the preceding courses is contained in Professor Webster's Treatise on Dynamics, B. G. Teubner, Leipzig.

3b. * The Theory of Resonance with Applications to the Measurement of Sound and to Wireless Telegraphy.

This course takes up Professor Webster's original researches in acoustics, and also shows how the methods there employed bear on the fundamental electrical phenomena involved in wireless telegraphy.

4. Electricity and Magnetism. The Classical Theories and the Theory of Maxwell, with an account of the principal methods for the solution of problems and applications to absolute measurements.

The substance of this course is found in Professor Webster's Mathematical Treatise on the Theory of Electricity and Magnetism, London, Macmillan & Co.

4a. * Recent Developments in Electrical Theory, including the Theory of Lorentz and the Principle of Relativity.

The application to the theory of electrons and to the optics of bodies in motion.

5. The Theory of Light. Propagation of Light, Diffraction, Reflection and Refraction, Dispersion, Double Refraction, Polarization, Metallic Reflection, Magneto-optics.

5a. * Comparison of Theories of the Ether.

Critical and historical examination of the various mechanical explanations of the luminiferous ether, including those of Green, McCullagh, Kelvin, Maxwell, Sommerfeld and Larmor.

5b. * Geometrical Optics. Properties of Systems of Rays, and their Various Aberrations. Hamilton's Characteristic Function or Eikonal. Applications to Optical Instruments.

6. Thermodynamics. Thermo- and Electro-Chemistry.

The establishment of the two laws of thermodynamics, and their application, by means of the methods of Gibbs and Helmholtz, to the examination of physical and chemical phenomena. Application to heat-engines, including steam, gas, and oil engines, the flow of gases and vapors, and the steam turbine. The conditions of chemical equilibrium, phenomena of electrolysis, osmotic pressure, and capillarity.

7. The Kinetic Theory of Gases. The Maxwell-Boltzmann Theorem and the Elements of Statistical Mechanics.

8. * The Theory of Radiation and of a Black Body.

The relations obtained from the laws of Kirchhoff, Stefan, Wien, and Planck, by the recent applications of thermodynamics.

9. * The Phenomena of Conduction of Electricity in Gases, and of Radioactivity, and their Bearing on the Structure of the Atom.

10. The Partial Differential Equations of Mathematical Physics.

Laplace's Equation, Equation of Thermal and Electrical Conduction, Equation of Wave-motion, Helmholtz's Equation, Lorenz-Beltrami Equation, Telegrapher's Equation, and their special cases; methods of

Cauchy, Green and Riemann-Volterra; Normal functions, Developments in Series, Fourier's Series, Legendre's, Laplace's, Bessel's and Lamé's functions.

This course is one of the most important for the physicist, and treats a great variety of subjects from the most varied fields, grouping them all into a connected system, and embracing all the methods of theoretical physics.

11.* The Elements of Integral and Integro-Differential Equations, and their application to Mathematical Physics.

12.* Selected Chapters in the Application of Theoretical Physics to Cosmical Phenomena, including Problems in Geodesy, the Tides, Meteorology, Seismology, and Terrestrial Magnetism.

13.* Linear Differential Equations.

The applications of the theory of functions to the linear differential equations of the second order which arise in mathematical physics.

14.* Orthogonal Surfaces and Curvilinear Coördinates and their Applications.

The courses for 1915-16 will be 5, 6, 7, 8, 10.

In addition to the above formal courses there is held a weekly Colloquium, or meeting for the informal discussion of subjects not treated in the lectures, and for the presentation by the students of reports on important articles appearing in the journals. A part of the work of the colloquium consists in the systematic presentation of certain classical researches, more or less connected with the lectures, in preparing which the students make use of the original sources of information, thus gaining much acquaintance with the methods of the masters in research. The work of the colloquium has an excellent effect in training students to present their ideas in a systematic manner before an auditory.

Among the various lines of investigation now attracting the attention of physicists the following are preëminent in importance. First, the interrelations between the luminiferous ether and ordinary matter, and the modifications necessary to be made in Maxwell's theory in order to explain the known optical and electrical phenomena of bodies in motion, and that aspect of the theory which deals with the properties of the small electric bodies known as electrons. This portion of mathematical physics is extremely new, and has hardly begun to appear in university courses in this country. Second,

the structure of the atoms of matter, to which the subjects of spectroscopy and the new and fascinating field of radio-activity give the most promising clew. Third, the thermodynamics of radiation in general, which is most intimately connected with the first, and about which a similar remark may be made as to the lack of instruction.

Of branches of applied physics now awaiting the attention of the mathematical physicist may be mentioned meteorology, seismology, and geophysics in general, in all of which the accumulation of experimental data is ahead of the development of theory, to such an extent in meteorology that Professor Arthur Schuster has said that it would be advisable to suspend all meteorological observations for the next ten years, until the theory should have in some degree caught up with the mass of information already accumulated. The theory of meteorology depends on complicated applications of hydrodynamics and thermodynamics; so as to make great demands upon the mathematical physicist, but the field is a rich one to him possessed of the skill to cultivate it. The study of earthquake phenomena is one that is now becoming of great importance in this country, while the investigation of terrestrial magnetism has lately made great advances.

It is almost obvious to the trained investigator that no one can expect to become a physicist of the first rank without a thorough training in mathematical physics, as without that the results of experiment will never be collected into a coherent system worthy the name of an exact science. Furthermore all mathematical physics must rest upon mechanics, the principles of which are of an importance transcending that of any other branch of natural science. It is for this reason that the courses in physics in this department begin with mechanics, and are developed progressively in a systematic manner. They have the advantage of having been deliberately planned for the needs of students of pure physics, as experience has

shown them to be prepared by the various colleges, and of being all delivered by the same person, so that logical consistency and continuity of method are assured. The waste of time often incurred by repetitions of the same subject and of changes of notation by various instructors is thus totally avoided. Attention is called to the fact that no branch of physics is left unprovided for in the course of lectures.

The aim of the department is to insure in its students some acquaintance with all the various fields of experimental physics, to develop in them the power of exact measurement, to accustom them to exact reasoning from experiment to theory, and to encourage original research conducted on a sound basis. To this end students will be put to work in the laboratory upon experiments of sufficient difficulty to give them skill in measurements of precision, and to enable them to become familiar with the precautions and corrections necessary to be employed in exact work. After a sufficient amount of experience has been gained, and the student has shown himself to be possessed of sufficient originality to warrant independent investigation, he will be encouraged to take up for himself an original research in the hope of making a personal contribution to science. In this research he will have at all times the benefit of the direction and advice of the professor.

It should be urged upon intending students to prepare themselves, not only in ordinary laboratory measurements, but also in mathematics, the lack of proper mathematical preparation being a serious drawback to the appreciation of the lectures. In particular may be recommended for study not merely those portions of the calculus which deal with the working out of many indefinite integrals, etc., but the theoretical portions which deal with the ideas of partial derivatives, definite integrals, and their practical manipulation, together with enough analytic geometry to involve the properties of lines and *surfaces* of the second order, and a fair

amount of the elements of determinants. As suitable text-books for preparation may be recommended to the student Lamb's, Osgood's or Gibson's Calculus, C. Smith's Analytical Geometries, and Muir's or Hanus's Determinants. Appell, *Elêments de l'analyse mathêmatique* may be very strongly recommended to the intending student for study before and during his course at the University.

It cannot be too strongly urged that the student should, from the beginning, be able to read French and German with ease and to make use of works in them.

REQUIREMENTS FOR THE DOCTOR'S DEGREE

1. The ability to read at sight specimens of scientific French and German, tested before the first of November preceding the Doctor's examination by a committee of two members of the Faculty.

2. The successful passing of an examination upon the general subject of Experimental Physics[1] and upon the subjects named above in the regular course in Theoretical Physics, as a major requirement, together with an examination in one minor subject, *to be determined in each particular case by the head of the Physical Department.* This subject will be Mathematics or Chemistry.

3. The presentation of a satisfactory dissertation, involving a substantial amount of original work, and forming a contribution of value to pure science. The presentation of the dissertation is a prerequisite to examination. The time of residence necessary for the proper fulfilment of the above requirements will generally be at least three years, of which at least one will be very largely devoted to work on the dissertation. Students will not be encouraged to enter upon the work of a dissertation until they have acquired sufficient experience to enable them to specialize with advantage.

The aim of the department is to produce physicists rather than electricians, acousticians, opticians, engineers, or narrow specialists of any sort, for although in the nature of things one will be obliged to know more of one subject than of others, yet it seems evident that no thorough knowledge of any branch can be gained without a comprehensive view over the

[1] Every student is recommended to provide himself with Winkelmann's *Handbuch der Physik* as a work for continual reference.

whole subject. Without this the specialist, or the experimentalist lacking a knowledge of mathematics, will continually be falling into pitfalls which the more wary avoid. Furthermore it can be but a detriment to science to encourage research in new fields by immature and ill-prepared minds and hands.

The following statement is here inserted for the benefit of students of mathematics.

The minor in Mathematical Physics consists of the subject-matter of courses 1, 2, 3, and 10, which are intended to constitute the equivalent of five hours a week for one year. Course 10 is given in alternate years to the other courses. The subject-matter of the course is contained in Dr. Webster's treatise on *Dynamics* and his work on Partial Differential Equations, now in press.

THE LABORATORY

The laboratory occupies three floors of one wing of a large well lighted building free from disturbances, and admirably adapted to the purposes of a physical laboratory. On the ground floor is a room extending across the end of the building forty-five feet long by twenty-two feet wide, with windows on three sides, above which are three similar rooms. A lift running from the bottom to the top floor affords means of transporting apparatus, while its shaft furnishes space for manometer or barometer tubes. In the lower room are four piers with heavy stone tops, and two others below the floor on which can be placed heavy tables.

Also on the ground floor is a large dark room, partially below ground, in which the temperature is tolerably constant, containing a very large and heavy pier. The engine and storage-battery room contains a kerosene engine and dynamo on the same foundation and sixty storage cells of ten amperes capacity, constituting the power-supply. The engine may be started at a few moments notice, even at night, but has

been superseded for most purposes by a motor-generator which is driven by an external supply and furnishes all needed direct current. The storage cells are conveniently arranged so that each one is accessible from each side, from above and below, and the ventilation is excellent, while the room is as light and clean as the work-rooms. Distributing switchboards allow the current from the dynamo or any section of the battery to be supplied to any of the rooms. On the same floor are three rooms constituting the workshop, one of the most important parts of a research department of physics. The first room is devoted to wood-working and pattern-making, and accommodates also a bench for soldering. The next room contains the machinist's bench, two engine-lathes and planer, and the third room a Rivet precision bench-lathe, jeweller's lathe and drill-press. There is no countershafting in the building, each tool being driven by a separate electric motor, so that perfect quiet and steadiness are ensured. In the shop are executed all repairs and alterations of apparatus, and the new apparatus requiring continual experiment is constructed. Most of the principal pieces of apparatus belonging to this department have been thus constructed. In this manner, by having a mechanic always present, an extremely great economy in time and money is effected, and vexatious delays, which would otherwise completely arrest the progress of the work, are avoided. Facilities and encouragement are given to the students to construct apparatus for themselves.

On the main floor are the lecture room, the director's office, the large room used as the director's private laboratory and apparatus room, and three other convenient rooms for research. Two of these are arranged so that they may be darkened for photography, and are also fitted with chemical hoods. The large room on the top floor is diagonally di-

vided into two, one dark and devoted to the Rowland twenty-foot diffraction grating, and with a photographic dark room attached. Close by is a high potential battery of two thousand small storage cells. Every room in the laboratory contains sinks, gas and electric light connections, and several circuits connecting with the switchboard in the battery-room.

The laboratory is well equipped with apparatus for research, besides having the facilities above described for the construction of instruments of any sort needed for that purpose. In addition may be mentioned a large collection of diagrams illustrative of mathematical physics, many of them being originals of the figures in Professor Webster's "Electricity and Magnetism" and "Dynamics," and a number of interesting models used in teaching dynamics, thermodynamics, and electricity. Among them are Maxwell's Dynamical Top and a number of other interesting tops, Maxwell's and Rayleigh's induction models, Gibbs's, van der Waals's and other thermodynamical surfaces. This collection of drawings and models can probably not be matched in this country, and is continually being increased.

The laboratory affords so much space that it is rarely necessary to put more than one student in a single room. Every student receives personal attention in the laboratory from the professor whenever he needs it, and is continually in receipt of instruction and suggestion by personal contact, the best form in which information can be imparted. Emphasis should be laid on the advantage to the research student of the contact with a professor who has no other duties or interests than the furtherance of research, in an institution devoted to this as its main object.

THE LIBRARY

In the library Clark University has one of its strongest features. With a large separate building, administered in

the most liberal manner with a view to the advantage of the research student, and with ample funds for the purchase of books, its facilities in the Department of Physics can hardly be surpassed. It may be said to contain all of the most important works in many languages, and is continually kept up to date, any book wanted needing only to be mentioned to be procured. The library is particularly rich in journals, among which are included the transactions of the learned societies of England, France, Germany, Italy, Austria, Holland, and Belgium. Other sets are being continually added. A list of journals will be found on pages 50–55. There are few subjects connected with physics which may not be thoroughly studied in this library.

III. CHEMISTRY

It is the purpose of the Department of Chemistry to provide the student with that broad training in the fundamental principles of chemistry which shall adequately equip him for a subsequent scientific career.

A considerable proportion of the students entering this Department naturally look forward to an academic career. It is not intended, however, to provide training for such men alone; for the equipment for technical research, whether for public or private interests, requires equally a thorough familiarity with the fundamental underlying principles of science and with the methods of experimental investigation.

Whether a student shall devote himself to pure or to technical research is a matter of individual interest and inclination rather than of training. The purpose of the Department is to provide the training on such broad lines that the student may develop into an accomplished scientific investigator whatever the particular line of work that he may ultimately choose to follow.

REQUIREMENTS

In addition to the formal requirements for entrance to the University, the student entering the Department of Chemistry should have a thorough knowledge of the fundamentals of chemistry, including general chemistry, qualitative and quantitative analysis, organic chemistry, and the elements of physical chemistry. The student should also have had mathematics through the elements of the calculus and not less than two years' work in physics, including general physics, the elements of thermodynamics with labo-

ratory work in heat, and the elements of the theory of electricity and magnetism with laboratory work in electrical measurements.

Students entering this Department, who have not had the work in both physics and mathematics as outlined above, will be expected to make up the deficiency during their first year. Excellent courses in these subjects, which are open to University students, are offered in the College. Students whose training in chemistry falls below the requirements above outlined, but who have had more extended courses in physics and mathematics may be allowed to enter the Department on condition that any deficiencies in chemistry will be made up during the first year.

A reading knowledge of French and German is indispensable for advanced work in chemistry.

Students who have done graduate work in other universities may enter the Department of Chemistry, receiving credit for residence (excepting the last year), provided the work done has been of such character as to provide the student with the necessary training.

INSTRUCTION

In order that a student may receive a broad training in chemistry, it is necessary that his time be properly distributed between class room work, research work, and library work. The Department endeavors, therefore, to keep the student occupied with these three lines of effort, without exclusion of one or more of them.

The following courses of instruction are offered:

PHYSICAL CHEMISTRY. This course consists mainly of conferences with numerous problems and references to the literature. A suitable text, such as Nernst's *Theoretische Chemie*, serves as a basis for discussion. The course extends over two years.

INORGANIC CHEMISTRY. This course consists of conferences in

which the various elements and their compounds are discussed. The students are given numerous references to the literature. It is intended here to familiarize the student with the properties of matter in its more important forms and to bring his knowledge down to that of the current literature. Both physical and chemical properties are considered. This course thus becomes supplementary to the preceding one. This course extends over two years.

Organic Chemistry. Conferences with reference to the literature. The purpose of this course is to familiarize the student with the present day conceptions and problems of organic chemistry. This course will be given every other year.

Special Topics. Special topics will be covered by lectures. These include: photo chemistry; colloids; radio-activity; the process of electrical conduction in gases, solutions, and metals; non-aqueous solutions; gas reactions, and other timely topics.

Journal Conferences. Conferences will be held weekly at which the current literature will be discussed.

Glass Blowing. A course of exercises in the manipulation of glass, fused quartz, etc. Every student is provided with a blowpipe and carries out the various manipulations under the guidance of an instructor. Once a week throughout the first term.

Minor Subject. Students choosing chemistry as major subject will be expected to take a minor in mathematics, physics, or biology. The choice of a minor subject will be made with reference to the student's previous preparation and to his ultimate aims as an investigator.

Research. In order that the student may become familiar with the methods of research and gain a knowledge of the minute details of one or more branches of chemistry he will carry on one or more researches throughout his three years of residence. Such researches will in all cases be in part experimental in nature. The subject for research may be one suggested by the student or one suggested by the instructor. In any case, the different investigations carried on in the laboratory at any one time will be largely diversified in order that the students may come into intimate contact with as many branches of chemistry as possible.

Since the student's early investigations will in all likelihood be more or less determinative of the subsequent trend of his scientific activities, his subject for research is chosen with much care and, if possible, he is given several subjects during the course of his three years' work in the laboratory. In addition he is expected to make himself thoroughly familiar with the details of the investigations of his fellows in the laboratory.

Library Work. It is essential that the student shall acquire an adequate contemporaneous knowledge of the entire field of chemistry. This can be done only by reference to the original literature, both past and current. He is expected, therefore, to devote a considerable portion of his time to familiarizing himself with the journals, periodicals, and other important sources of information available in the Library. The various courses are given in such manner as to lead the student on in this direction.

FACILITIES

The Laboratory. The Chemical Laboratories occupy the entire third floor of one wing of the Science Building. The College Chemistry Department occupies the two floors below, while the University and College Physics Departments occupy the adjacent wing. This arrangement is a particularly happy one since it affords a convenient interchange of material and apparatus between the closely allied departments. At the same time, what is even more important, it provides for the mutual interchange of ideas. Students in chemistry will thus become familiar not only with the research work done in their own department, but also with that done in other departments.

In addition to the usual equipment of a chemical laboratory, the following apparatus may be mentioned as being available for research work: A special water still for "con-

ductivity water;" a 2-kilo balance, sensitive to one-tenth milligram; a Hilgar quartz spectograph; a Pulfrich refractometer; a Leeds and Northrup conductance apparatus, including a bridge, air condenser, telephone, and high frequency generator and two one hundred and eleven thousand ohm resistance boxes (Curtis's wound); a ten thousand ohm resistance box in steps of one-tenth ohm, a Leeds and Northrup New High Sensitivity Galvanometer, several less sensitive D'Arsonval Galvanometers, a Leeds and Northrup Potentiometer, a platinum resistance thermometer together with bridge, a set of large capacity vacuum pumps giving pressures as low as 0.00005 mm., thermostats, motors, vacuum jacketed tubes, McLeod gauges, etc.

Through the courtesy of the American Academy, there has been placed at the disposal of the Department a specially constructed assay balance sensitive to one one-thousandth milligram provided from the Warren Fund and an automatic refrigerating machine provided from the Rumford Fund.

The Department is provided with a laboratory shop which includes a grinding wheel, bench lathe with accessories, and a complete equipment of small tools. The Physics Department has a well equipped shop with a competent mechanician in attendance whose services may be arranged for when required. The laboratory shop is merely intended to be used when its use serves to save time. The shop is also equipped with an oxy-acetylene welding outfit.

Since glass apparatus forms a large part of the necessary equipment for research, the laboratory provides a complete stock of glass tubing. This includes ordinary soda glass in all sizes, which is used chiefly for glass blowing exercises; a complete stock of lead glass employed in the construction of apparatus; a stock of special glass of coefficient

3.5×10^{-6}, which is employed in apparatus where the conditions of use are especially given. In addition there is available an unusually good stock of transparent quartz tubing, as well as of electro quartz.

A complete stock of all ordinary supplies, such as stopcocks, stoppers, rubber tubing, etc., is always kept on hand.

The Department is always ready to purchase special apparatus or material required for research work, while the equipment of permanent apparatus is constantly being added to.

The Library. The library facilities which the University affords to students in chemistry are the best obtainable. Complete sets of journals and periodicals are kept on file, together with text books, treatises, etc. New books are placed on display on the library tables and such as are of value are ordered on request.

The student has free access to the shelves and files. Tables are assigned in proximity to the book shelves where the student may leave permanently books and paper with which he is engaged. A more detailed description of the library facilities will be found elsewhere.

SCHOLARSHIPS AND FELLOWSHIPS

A considerable number of scholarships and fellowships are available for students in this Department under conditions set forth elsewhere.

DOCENTS AND HONORARY FELLOWS

Docents and Honorary Fellows are appointed under the conditions as set forth elsewhere. The Department welcomes such men as have already obtained their Doctor's degree and who for one reason or another wish to devote themselves for some time to research work. Every facility

and encouragement will be afforded such men for the furtherance of their work.

DEGREES

Master of Arts. The formal requirements for this degree do not necessarily include an original investigation on the part of the candidate. However, the candidate must demonstrate that he possesses a working knowledge of the fundamental elements of the Science of Chemistry. Obviously, in the case of a science so largely founded on experimental facts as is chemistry, the power to carry on an experimental investigation constitutes one of the most simple and direct means for demonstrating that the candidate possesses the necessary scientific qualifications for this degree.

Doctor of Philosophy. The formal requirements for this degree are given elsewhere. Among other things, they include three years of residence (or its equivalent in other institutions), with attendance on lectures, and the successful completion of an investigation which constitutes a contribution to the Science of Chemistry. The requirements for a degree cannot, however, be fulfilled by merely observing the formal requirements as to residence, attendance on lectures, and the like. On the contrary, while all formal requirements must be scrupulously fulfilled, to receive the degree of Doctor of Philosophy, the candidate must clearly demonstrate that he possesses those scientific attainments which are essential to an active and productive scientific career.

IV. BIOLOGY

The work of the biological department has reference chiefly to the problems of general physiology, *i.e.*, problems dealing with or bearing upon the peculiarities of vital processes as such. In modern physiology living organisms are regarded as material systems having special and highly distinctive characteristics which are subject to analysis by the methods of the exact sciences. The problems presented by the living cell—a system consisting largely of colloidal material and distinguished by the possession of metabolism and other unique peculiarities—are most effectively approached from this point of view, and fundamental progress in general physiology has been due chiefly to the application of the sciences of physics, chemistry and physical chemistry to the analysis of the vital processes. The biological department offers instruction and facilities to those interested in the application of the physical and chemical sciences to the problems of general physiology. Students and investigators in this field will find unusually good opportunities for gaining the requisite knowledge of physics, chemistry and especially physical chemistry, and every effort will be made to correlate their work in these departments with their physiological work. Students of the physiological analysis of the reactions and behavior of normal intact organisms are offered the further advantage of coöperation with the department of psychology. Work in the physiology of development, comparative physiology, general pharmacology and other fields of research in which marine animals are especially valuable may be conducted during the summer at the Marine Biological Laboratory at Woods Hole under

the direction of Professor Lillie, and credit for work done at Woods Hole will be given in Clark University.

The laboratory is equipped with the usual apparatus and materials for work in general physiology. Any additional apparatus, animals or chemical reagents required for the purposes of any special research will be provided wherever possible. The conditions are especially favorable with regard to scientific literature. Complete files of nearly all of the important journals in zoölogy, physiology and biological chemistry are in the library, as well as a large number of special works in these sciences, and literature in other biological fields (botany, medicine) can be procured on short notice.

For admission to the laboratory students should have had adequate previous training in biology, chemistry and physics. Resident men students whose preparation in these subjects is insufficient may remove these deficiencies by taking the courses offered in Clark College. Students desiring to attend lecture courses without taking laboratory work can make special arrangements to do so.

The following courses are offered:

1. Fundamental Problems of General Physiology. This course is introductory and will deal chiefly with the physiology of the living cell from a physico-chemical point of view. The subject matter will be divided somewhat as follows: The distinctive characteristics of living as distinguished from non-living matter; chemical composition of the cell; enzyme action; the physico-chemical constitution of the cell; the nature and significance of cell-organization; the importance of the colloidal state in physiological processes; the rôle of electrolytes; the physiology of stimulation, contractility, and related processes; the general reactions and elementary behavior of intact organisms (tropisms, etc.); the general characteristics of metabolic processes (oxidations, syntheses, interchange with surroundings); cell-reproduction, fertilization, development and heredity. Dr. Lillie, *two lectures weekly, October to June.* Students with sufficient preparation will be assigned laboratory work in connection with these topics.

2. Special Problems of General Physiology. A more advanced

course of lectures will be given on topics of general physiology, having especial reference to the problems under investigation in the laboratory. Hours will be arranged to suit requirements. Dr. Lillie, *October to June.*

3. Biological Seminar. The Seminar will meet once a fortnight to present results of research and to review and discuss recent literature. *October to May.*

4. Special Topics in Biological Chemistry. The aim of this course is to present in greater detail than is usually possible in a more general course, certain subjects of particular interest to students intending to undertake biochemical research. The subject at present offered is the biochemistry of the proteins. The discussions will include the physical and chemical properties of the proteïns, their metabolism, and general physiological significance. Dr. White. *One lecture weekly, October to June.*

V. PSYCHOLOGY

A complete course in Psychology at Clark University includes the following subjects:

1. Anatomy and Physiology of the Brain and Spinal Cord, sense organs, and other parts of the body, especially the muscles—the organs of the will—in so far as they are concerned with mental processes—together with a good general background of biology. For this a special laboratory is equipped.

2. Physiological and Experimental Psychology, including an outline of the anatomy and physiology of the central nervous system and sense-organs; the elementary sense-experiences; sensation and perception; the measurement of sensational intensity; space; time; reaction-times; affection and emotion; memory; association; attention; apperception; will; the "higher mental processes;" inter-relation of mind and body. For this a special laboratory is equipped.

3. Comparative and Genetic Psychology. Review of the general doctrine of evolution as a basis for the evolution of mind. Discussion of experimental and observational studies upon typical forms of animal life, beginning with the protozoa. Instincts; animal and human infancy. Childhood and adolescence.

4. Abnormal and Morbid Psychology, as nature's experiments, *e.g.*, border-line phenomena as seen in neurotic subjects, prodigies, and geniuses; defectives, such as the blind, deaf, criminal, idiotic; mental and nervous diseases, epilepsy, phobias, neurasthenia, hysteria; morbid modifications of will, personality and emotion, etc. Special clinical facilities for this work are open to the department in the hospitals and other institutions of the city.

5. Anthropological Psychology; myths, customs and belief, comparative religion and psychology of religion, primitive art, and the study of the life of savages and children; adolescence and senescence; physical measurements illustrating laws of growth in size and power, etc.

6. Æsthetics and Ethics, the psychology of music, painting, literature, the phenomena and laws of volition and morality.

7. History of Psychology and Philosophy, including the chief culture institutions, science, medical theories, Christianity, and education generally.

8. Applications of Psychology, Pedagogy, including mental and moral hygiene and regimen, school organization and methods from kindergarten to university; the sex problem; defectives, etc.

9. The Psychology of Sex; lessons from the aberrations of this instinct; some of its normal phenomena; the current theories; psychic differences between men and women; education of girls; fatherhood, motherhood; instruction of the young in matters pertaining to sex; theories of Freud, Moll, Ellis, etc.

10. The Psychology of Border-Line Phenomena, including spiritism, telepathy, hypnotism, dreams, multiple personality, somnambulism, crystal gazing, dowsing, mind reading, sleight of hand performances, major symptoms of hysteria, psychotherapeutics and mind cure, methods of psychological analysis, etc.

The aim of the Psychological Department is to cover this field as well as its instructors are able to do so in two or three years.

The following courses are announced for the academic year 1915–1916.

Dr. Hall's Courses

Dr. Hall expects to give the following courses next year, although variations from this programme may be made if there is reason to believe that the greatest good of the greatest number of students will be thereby promoted:

1. The Psychology of the Feelings and Emotions. This course will involve a brief sketch of the history of the theories in this field and a much more extended account of the recent experimental, clinical and genetic work done in this department. The purpose of the course is to give a clear account of the present condition of our knowledge of each of the feelings, one after another, pleasure and pain, fear, anger, sympathy, jealousy, love, hate, etc.

2. Psychogenesis. This course will begin with an account of the theories of the origin both of life and of mind, with chief emphasis upon the latter. There will be a survey of the results of experimental biology,

concerning elemental life or substances that resemble it, then experiments and observations upon the simplest organisms. This will be followed by a résumé of our knowledge of certain typical forms of animal instinct up the series, and upon this basis the contributions to paleontology will be drawn upon and certain lessons as to the development of the instinct of type forms of life; the horse, camel, monkey and other typical forms will be dwelt upon at some length. This will be followed by a brief account of culture stages of the human race from the paleolithic age and that of the troglodytes up.

3. The Psychology of Religion. This falls into two halves:—first, the origin of religion, from animism and manaism up to the ethnic religions other than the Hebrew and Christian; the latter, focussing in the psychology of Jesus, constituting part two.

4. The Psychology of Appetite, Foods and Nutrition.

5. Some Vital Problems in Education. This course will be given Saturdays for teachers and the special field it covers will be announced later.

6. The Seminary, at Dr. Hall's house, three hours every Monday evening through the year.

7. Researches with individuals on special topics.

EXPERIMENTAL PSYCHOLOGY

The primary purpose of this department is to train students for the investigation of psychological problems. The lecture courses and the Journal Club aim to familiarize the student with the history and the present status of psychological experimentation; the laboratory courses are arranged with a view to training him in experimental procedure, and equipping him for independent research.

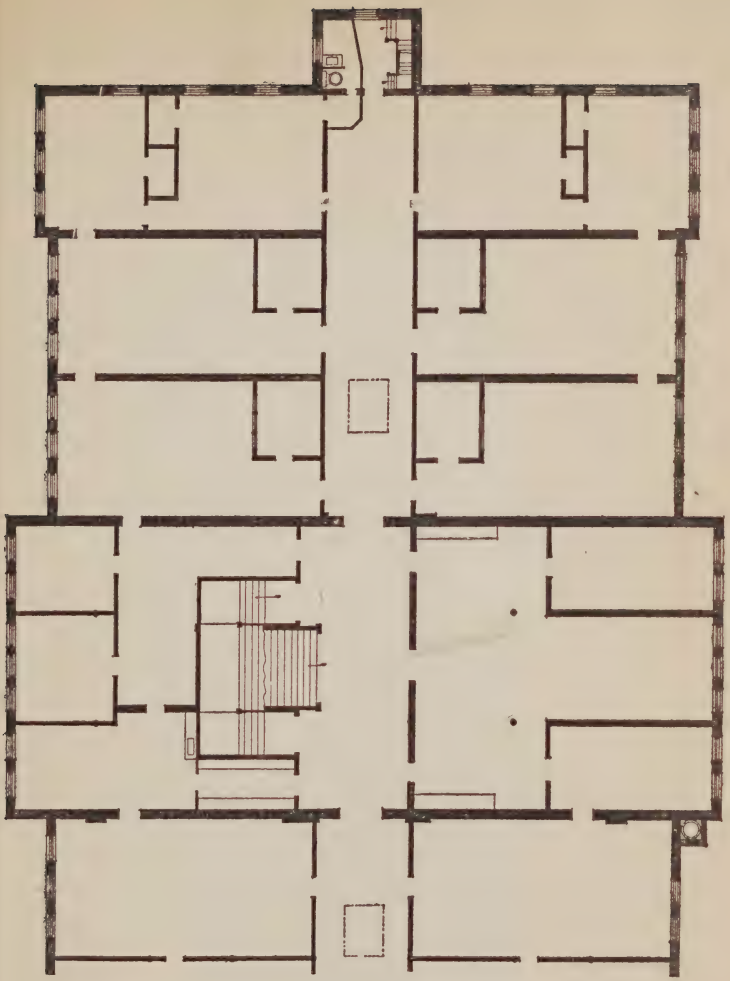
LABORATORY

The psychological laboratory occupies a suite of twenty rooms on the upper floor of the main building of the university. These rooms, as at present arranged, are devoted to the following purposes: office, lecture-room, seminary and reading-room, dark-room, work-shop, general apparatus-room, and a group of rooms for research.

The laboratory is well equipped with general apparatus; and it has an annual appropriation sufficient to provide for the purchase and manufacture of such apparatus as is required from time to time for special investigations. The workshop contains power- and other lathes, a power-drill, and an abundant equipment of tools and materials for the manufacture and repair of apparatus. The services of an expert mechanician are available; and every facility is provided for the devising and constructing of apparatus appropriate for the solution of such special problems as are undertaken.

The library contains an unusually large collection of psychological literature. It is especially well supplied with scientific periodicals and proceedings of learned societies. Since the enrolment of the department consists exclusively of graduate students, and is, therefore, relatively limited in numbers, it is possible to give to each student of the department a maximum of freedom in the use of the library. Besides having access to the university library, students of the laboratory have at their disposal an excellent working-library of psychological books and periodicals which are shelved in the seminary-room.

The more general and fundamental courses of lectures in the department are repeated each year, while the more advanced and specialized courses are given only in alternate years. A feature of the method of instruction at Clark University is the frequent informal conferences between instructor and student. The Journal Club meets weekly (two-hour sessions) for the discussion of the current literature. The more valuable contributions presented by the members of the Club will be published in the *American Journal of Psychology*. The laboratory work includes an introductory and a research course. The former is designed to familiarize the student with the efficient handling of apparatus, and to acquaint him with the methods to be followed and the



PSYCHOLOGICAL LABORATORY

precautions to be observed in psychological experimentation. This course is repeated each year; it, or its equivalent, is a prerequisite to all other work in the laboratory. The research varies from year to year.

Provision for Comparative Psychology is now made at the Hadwen Arboretum, about fifteen minutes' walk from the main building of the University, where special facilities for the care of the animals have been provided.

DR. BAIRD'S AND DR. FERNBERGER'S COURSES

1. General Psychology. A course of lectures and demonstrations dealing with sensation, affection, attention and perception. This course will present, in concrete and systematic form, the more important facts that have been yielded by the experimental investigation of the simpler mental processes, together with a discussion of theories that have been advanced from time to time. Dr. Fernberger. *Two hours a week. First semester.*

2. The Application of Statistical Methods to Psychology. A course of lectures and demonstrations in which will be considered the calculations necessary for the practice of the psychophysical methods and also the relation between the methods. The distribution of relative frequencies, correlation and similar topics will also be considered. Dr. Fernberger. *One hour a week. First semester.*

3. The Psychology of Language. A course of lectures dealing with an analysis of the language function, with special reference to the study of the aphasias. In this course will also be considered the anatomical basis of language, the origin of language ontogenetically and phylogenetically considered, as well as such special topics as the psychology of reading. Dr. Fernberger. *One hour a week. Second Semester.*

4. Laboratory Work in Psychological Statistical Methods. In this course a limited and selected group of students will be given practice in the actual calculations and in the acquiring of the data that will form the basis for these calculations for the different methods discussed in Course 2. Dr. Fernberger. *Two or three hours a week. Second Semester.*

5. The Psychology of Memory, Imagination and the Process of Learning. Lectures and demonstrations dealing with the phenomena of mental acquisition and retention; imagery, association and reproduction, the phenomena of learning and forgetting, the function

and development of habits. Dr. Baird. *Two hours a week. Second semester.*

6. The Psychology of the Higher Intellectual Processes. The psychology of meaning, abstraction, thought, judgment, reasoning; the function and significance of imagery; the phenomena of *Bewusstheit, Bewusstseinslage, Aufgabe, Einstellung* and *determinierende Tendenz.* Dr. Baird. *One hour a week.*

7. Psychological Systems. A statement and discussion of the characteristic features of the systematic doctrines embodied in the writings of representative psychologists, past and present. Dr. Baird. *One hour a week.*

8. German Translation. A course for the rapid reading of a German psychological text. Dr. Baird. *One hour a week.*

9. Comparative Psychology. A description and discussion of investigations of animal learning. Dr. Baird. *One hour a week.*

10. Journal Club. A seminary for the informal discussion of current psychological literature. Meetings are held weekly throughout the year.

11. Introductory Experimental Course. In this course the student will perform a series of standard psychological experiments, chiefly for the purpose of mastering the technique of experimentation. The course will be given by Dr. Baird, Dr. Fernberger and Mr. Wheeler. *Four to six hours a week, throughout the year.*

12. Research Course. Under this title are grouped the special investigations undertaken by students in the laboratory. *Topics and hours to be arranged.*

DR. KARLSON'S COURSE

History of Philosophy. The work in philosophy at Clark University is essentially limited to a thorough, though introductory, course, including lectures and texts covering the entire history of philosophy from Thales to Schopenhauer, both inclusive, as fully as can be done in two hours a week. The instructor makes no attempt to teach systematic philosophy, logic, ethics, metaphysics, psychology, or any of the special disciplines, and deals with the history of philosophy in the sense of Zeller, Fischer, Ueberweg, and the rest, in the historic spirit, with some biographical matter, teaching the chief opinions of each important man and then passing to another, and not stressing any of the above specialties. The idea is that the historian should be metaphysician, logician, ethicist, epistemologist, psychologist, etc., just as

much as was the man whose system he is expounding for the time, chiefly finishing one author before passing to another, following largely the chronological order, and teaching each system more as literature than as dogma, avoiding indoctrination, and teaching every doctrine or view sympathetically, letting the systems criticize each other, and in general reserving his own criticisms until after his sympathetic presentation has been made, and striving to fit for our examination in such a way that we can plan ultimately to require this course of all who take degrees in psychology or education. *Given two hours a week throughout the year 1914–1915.*

The following courses offered by Professor James P. Porter in Clark College are open to students in the University:

1. General Psychology. Three hours a week, throughout the year.

2. Social Psychology. Three hours a week, throughout the year.

3 a. The Evolution of Mind and Genetic Psychology. Three hours, second semester.

3 b. Educational Psychology. Three hours, first semester.

4. Laboratory Course in Experimental Psychology. Three hours a week, throughout the year.

5. Advanced Psychology. Attention, feeling, emotions and will. A lecture and seminar course. Three hours, throughout the year.

At the Hadwen Arboretum, where a "station for the study of animal behavior" has been established and is now under Dr. Porter's direction, are found facilities for the study of certain forms of animal life; and here too will be found some of the illustrative material for his lectures.

Psychiatry

Dr. Cowles, lecturer on Psychiatry, former head of the McLean Hospital at Waverley, Mass., will give a course at the University and the Worcester State Hospital for the Insane. Dr. Cowles's course includes the following topics with clinical demonstrations.

THE MELANCHOLIA-MANIA GROUP OF NEUROPSYCHOSES:

1–2. The dependence of Psychiatry upon Mental and General Physiology; the concept of energy fundamental; the reflex arc and integrative action of the nervous system. Relation of inhibition to anabolism, to external function and katabolism.

3. Conduction-paths and Threshold Values: changes in physiological conditions in relation to the determination of psychical effects—normal habit—overuse and disuse—mental symptoms.

4. The Physiology and Pathology of Emotion; depression and exaltation figurative expressions in psychology, both being excitative and katabolic; relations of feeling-tone to conditions of ill-being.

5. Psychasthenia and Neurasthenia; the minor psychoneuroses—psychological automatism, fixed ideas, hysteria.

6. Mental Symptoms of Nervous Exhaustion; their genesis in reductions of functional capacity of the nervous and mental mechanism.

THE DETERIORATING PSYCHOSES:

7–10. Dementia praecox, general paresis, senile dementia. Involution psychoses, paranoia.

VI. PEDAGOGY

This department offers a course which can be taken for the degree of Doctor of Philosophy. Its work is in the closest connection with that of psychology and anthropology, and in part based on these subjects. The work in this department is intended to meet the needs of the following classes of students.

First. Those intending to teach some other specialty but who wish a general survey of the history, present state, methods, and recent advances in the field of university, professional and technical education.

Second. Those who desire to become professors of pedagogy, or heads or instructors in normal schools, superintendents, or otherwise to become experts in the work of education.

The programme of the Pedagogical Department includes courses or part-courses upon the following subjects:

1. (*a*) Child Study. (*b*) Pedagogical Psychology. (*c*) Experimental Pedagogy. (*d*) School Hygiene.

2. (*a*) Principles of Education. (*b*) History of Education and Reforms. (*c*) Methods, Devices, Apparatus, etc.

3. (*a*) Organization of Schools in Different Countries. (*b*) Problems of College Education. (*c*) The Teaching Profession. (*d*) Motor Education, including manual training, physical education, etc. (*e*) Moral and Religious Education. (*f*) Ideals.

The courses in pedagogy for 1915–1916 will be as follows:

DR. WILLIAM H. BURNHAM'S COURSES

A. Hygiene of the School Child. This course has been given in alternate years with the course on the Hygiene of Instruction. Some of the more important chapters in modern school hygiene will be con-

sidered, including such topics as: The conditions that determine growth and development. Physiological age. The physical and mental differences between children and adults. The general principles of somatic and mental hygiene. The hygiene of the senses. Modern studies of defects of sight and hearing. School diseases. The hygiene of the voice, the mouth, the teeth, the nose. Tests of ability to work and of physical condition. Medical inspection. The hygiene of discipline. The development of healthful mental activity. The hygiene of memory, attention, and feeling. The hygienic aspects of recent psychological studies. Problems in mental hygiene and the hygiene of instruction. *One hour a week, throughout the year.*

B. Principles of Education. This course treats certain fundamental educational principles and involves also a study of several important chapters in the history of education, with a brief account of a few representative educational systems. Such topics as the following will be included. Educational ideals. The dominant aim at different stages of development. The correlation of educational forces. The family and education. The church and education. State aid and control. The field of scientific study in education. Antithetic educational principles. The history of nature versus convention in education. Rousseau. Pestalozzi as "pedagogical socialist." Modern Sozial-Pädagogik. Present problems and tendencies. *One hour a week, throughout the year.*

C. Seminary. The work will be determined in part by the needs of the students who elect this course. It is hoped that each student will select, after consultation with President Hall and Dr. Burnham, a topic for special investigation. The results of such studies may be published. *One or two hours a week, throughout the year.*

President G. Stanley Hall's Course

Some Vital Problems in Education. See special circular later.

Dr. Edmund C. Sanford's Course

Problems of College and University Education. A discussion of the most important questions of college efficiency with especial reference to present day tendencies and criticisms. *Given one hour a week first half-year 1914–1915.*

The courses as announced above may be modified somewhat as the needs of the students or other circumstances may require.

THE CHILDREN'S INSTITUTE

The Children's Institute, under the auspices of the Educational Department of Clark University, provides lectures each year, in the small lecture-room on the second floor of the new wing of the library building, from nine to ten o'clock on Saturday mornings, open not only to students but to all others interested. This work varies from year to year. During the present academic year Prof. U. Waldo Cutler has lectured upon Community Organization for Social Service; Dr. Amy E. Tanner upon Child Study; Mr. W. L. Dealey upon Child Welfare Institutions in Their Relations to Child Study; Dr. Frank K. Sechrist upon the Psychology of Speech Development.

The Children's Institute has a large hall with three adjacent rooms, comprising one entire floor in the new Library Building devoted to an educational museum, which is equipped with hundreds of maps, charts, diagrams, illustrative and other apparatus gathered from many countries, to ease the work of teaching and make it more effective. This material is used in various departments, but especially by that of Education.

Special attention has been given to the collection of the circulars and other publications of nearly one hundred types of child welfare organizations with which the department seeks to keep in touch.

The library of the department has a large collection of EDUCATIONAL LITERATURE, being especially rich in German and French literature, and having a large number of official reports from various countries—English, French, German, Belgian, Swedish, etc.; also town and city reports, and re-

ports of special institutions; and a collection of French, German, and American text-books.

The books are arranged under the following heads:

1. General.
2. History of Education.
3. Educational Systems.
4. The Theory of Education and Special School Subjects.
5. Educational Psychology.
6. Child Study.
7. School Hygiene and Physical Education.
8. Text-Books.
9. Miscellaneous.

Many of the more common educational books are accessible in the Worcester Public Library and have not been duplicated by the University. The large collection of educational text-books in the library of the American Antiquarian Society and its valuable historical material are also accessible to the University.

The collection of educational periodicals includes a large number of the best foreign journals—English, French, German, Swedish, etc.

The nucleus of an educational museum has been formed. This is now merged with the museum of the Children's Institute, and contains a valuable collection of educational apparatus, pictures, illustrative material for language lessons, *Anschauungsunterricht*, toys, kindergarten material, maps, charts, diagrams, text-books, lantern slides, moving picture films, photographs and illustrative material of various kinds in school hygiene, history, arithmetic, language, the natural sciences, etc. One room contains a collection of apparatus for the teaching of arithmetic, abacuses of various kinds, charts for counting, reckoning machines, number tablets, weights, measures, geometrical models, and astronomical charts and apparatus. Another room contains a collection

of toys from different countries, a number illustrating scientific principles in physics and the like. A third room is devoted to apparatus and illustrative material in school hygiene. The collection includes seats and desks, charts illustrating good and bad posture, hygrometers, apparatus for ensuring cleanliness, for testing the air, charts illustrating the incidence of school diseases, the effects of antitoxins, etc. and a collection of the antitoxins for the various diseases. The main room is largely filled with pictures, models, maps, charts, and illustrative material for teaching the different school subjects and the different sciences. During the year 1913–14, 989 additions were made to this collection. A catalogue of the department of School Hygiene in the Museum has been published. It is hoped that catalogues of other departments will soon be prepared. This museum is open to students, teachers, and others at definite times. It is now under the direction of Professor W. H. Burnham.

The *Pedagogical Seminary* is a journal issued at the University, and serves as a convenient medium of publication for special investigations undertaken in the department.

VII. ECONOMICS AND SOCIOLOGY

The courses here outlined indicate the scope of the work offered. At least two hours work per week and a seminar are given each year.

1. Recent Economic Theory. This course is devoted to a comparative study of the theories of Marshall, Clark, Böhm-Bawerk, Fetter, Hobson and Carver, as presenting leading types of modern economic theory. The chief emphasis is placed on the problems of value and distribution; on the tendencies toward monopoly and other interferences with normal adjustments; and on the influence of the growth of coöperation and consolidation. This course should be preceded by at least an elementary study of economic theory. *One hour per week.*

2. General Sociology. A series of lectures dealing with social origins and evolution and sociological analysis. Topics treated include the origin of man, of races, and of society; primitive ideas; religion, its origin, evolution and function; the family; tribal society; the state; philosophies of history. The analysis of social factors treats the physiographic, biological, economic and psychological basis of society and such special processes as natural and artificial selection; communication; coöperation; competition; differentiation; socialization. *One hour per week.*

3. Problems of Population. Considers various laws of population as developed by Malthus, Spencer, Nitti and others; vital statistics, birth and death rates, heredity and selection with some attention to statistical methods; theories of racial decay; eugenics and race-regeneration; and biological and sociological conditions affecting the supply of genius. Lectures, reports, discussions. *One hour per week.*

4. Journal Club. Given to reports on theses and selected portions of the current literature. Special attention is given to the periodical literature dealing with population questions or with some phase of sociological inquiry. *One hour per week.*

VIII. HISTORY

The distinctive feature of the work of this Department is its aim to give its students a general knowledge of the history of the world as a whole, not merely of the United States and of three or four of the nations of Europe. The laws of historical development can be fully understood only after a study of all important peoples, including those in Latin America, Asia and Africa. Emphasis is placed upon existing conditions, both because these are most vital and because they furnish the richest material for a comparison of the different stages in the world's political, economic, social and religious advance.

ANNUAL HISTORICAL CONFERENCES

In carrying out these features of its work, the Department has arranged annual conferences for the discussion of the history and the present-day conditions of various lands. In 1909 the sessions dealt with the Far East, including China, India, the Philippines and Hawaii; in 1910 with the Near East and Africa; in 1911 with Japan and Japanese-American relations; in 1912 with Recent Developments in China; and in 1913 with Latin America. Altogether more than one hundred and fifty men have taken part in these conferences —university professors, anthropologists, leading natives, government officials, travellers and missionaries—all of whom could speak with authority. Their addresses and papers have been published by the University first in the quarterly issues of the *Journal of Race Development* and later in a series of bound volumes.

Professor Blakeslee offers the following courses:

1. United States History. Different periods are taken for intensive study in successive years. In 1914–15 the course is dealing with the period from the close of the Civil War to the present time, and includes the economic and social development of the country during these years as well as the history of politics. In 1912–13 it included the period from the formation of the Constitution to the Missouri Compromise; and in 1913–14, from the Missouri Compromise to the outbreak of the Civil War, with emphasis upon the years following the Compromise of 1850. It treated especially the institution of slavery as it existed in the Southern States, the origin and growth of the abolition sentiment, the doctrine of states rights and the development of the antagonism between the North and the South till its culmination in the Civil War. The lectures are supplemented by reports presented by students upon assigned topics. *Two hours.*

2. The Expansion of the United States. The history of the successive territorial acquisitions of the United States is given, including the diplomatic negotiations and the relations with foreign powers. This is followed by a study of the constitutional questions involved, especially those regarding the status of newly acquired possessions and of present-day dependencies; the differences between incorporated and unincorporated territory; and the rights and privileges of inhabitants and citizens of the various lands considered. The aims and the continuity of the American Colonial policy are pointed out. *One hour.*

3. International Law. The aim of this course is to give a knowledge of the general principles of International Law. So far as possible definite cases are studied, and for that purpose Scott's "Cases on International Law" are followed. Especial attention is paid to the legal questions involved in the existing international controversies; to the history and present status of arbitration; and to the modifications in International Law introduced by such international Congresses as those held at The Hague. During the present year, the problems in international law arising from the present war in Europe and from the relations of the neutral to the belligerent states, are being given the closest study. The leading authorities and the cases are supplemented by lectures and discussion. *Three hours.*

4. English History—The Period of the Tudors and the Stuarts. The course extends from the accession of Henry VII, in 1485, to the death of Queen Anne, in 1714, and deals especially with the establishment of practical absolutism under Henry VII and Henry VIII; the rise

of Protestantism; the development of Puritanism in state and church; the great Civil War; Cromwell and the Puritan ascendency; the attempts to form a firm constitutional government; the relation of English Puritanism to that of Switzerland and New England; the restoration of monarchy; and the final triumph of Parliament in the overthrow of James II. Emphasis is placed upon the study of the constitutional documents and other sources. *Two hours.*

5. Russia. The lectures discuss particularly the revolutionary movement, including the abuses of autocracy and bureaucracy, the character and methods of the revolutionists, the economic and political ability of the peasants, the widespread acceptance of socialism by the educated classes, the influence of the church, and the recent reforms by the government. *One hour. One Semester.*

6. The Far East. The lectures deal with Russia in Asia; Japan, with its colonies, Formosa and Korea; Manchuria, including the history and present status of the struggle for its control; China and the revolution; the Philippines and Hawaii; and the International politics of the Far East and of the Pacific Ocean. *One hour. One Semester.*

7. British Colonies and Dependencies. A survey of the important political, economic and social conditions in the leading British possessions, especially in Canada, Australia, New Zealand, India and Egypt; and a discussion of British colonial policy and problems. *One hour. One Semester.*

8. Latin America. A survey of the history of the various countries is followed by a consideration of international diplomacy, political problems, systems of government, race questions, and economic and industrial conditions. Especial emphasis is placed upon the past and present relations, both in trade and diplomacy, between the United States and the countries of Latin America; this involves a careful study of the Monroe Doctrine. The lectures are based, in part, upon material which has been secured in a recent trip to South America. *Two hours.*

9. Historical Seminar. The students in the Department of History meet one evening a week in a seminar for the consideration of particular topics of historical interest. Each member is expected to present reports which then form the basis for a general discussion.

The present year the Seminar is devoting its time to a consideration of present-day diplomatic problems, especially those relating to the European conflict and those in which the United States is a party. A critical study is made of the diplomatic correspondence relating to the various international controversies.

During the year, 1914–15, courses 1, 3 and 9 are given.

Dr. Gras offers the following courses:

1. The Economic History of Europe from 1300 to the Present. The work in this course consists largely of oral reports. These are commented upon by the lecturer and made the basis of general discussion. Such topics as the following are studied: the origin of towns, the decay of the manor, the rise of a free tenant class, the revolts of 1381 and 1525, the enclosure movement; the Hanseatic League, Italian commercial supremacy, the formation of national companies, the struggle for a market, the history of prices; medieval crafts, the domestic system of industry, the industrial revolution; mercantilism, the free-trade movement, modern protectionism, national economic regulation. The object of the course is in part to familiarize the student with the literature on the subject. A reading knowledge of French and German is of great service. *Two hours.*

2. The Economic and Political History of Europe since 1789. Lectures are delivered on such topics as the French revolution, the Napoleonic régime, the proletarian upheavals, the industrial revolution, the history of trade unionism, socialism and syndicalism, the formation of the German Empire and of the Kingdom of Italy, the struggles of the papacy. *Two hours.*

3. The History of Economic Stages. The accepted economic stages are examined in detail, the agricultural, industrial, commercial and politico-economic. Most of the work, however, is constructive, an effort being made to synthesize the various schemes into one system centering about the market. *Two hours.*

4. The Renaissance in Europe. An analysis is made of the movement in its various aspects. The problems of its origin are studied, its relation to the economic progress of towns, to the development of Gothic art and to the discoveries of classical models; also its relation to the condition of the Catholic Church, the Protestant reformation and the counter-reformation. *Two hours.*

5. The Literature of English History. In this reading course in English history, the students discuss with the instructor the various books recommended for study. *One hour.*

During the year 1914–15, courses 1 and 5 are given.

LIBRARY

The Library is under the control of a Library Committee, appointed by the Trustees, of which the President of the University is *ex officio* chairman. The duties of this committee are to advise concerning the arrangement, cataloguing, use of books, and other matters pertaining to the Library not reserved to the Trustees nor otherwise provided for.

Library Committee

President G. Stanley Hall, *Chairman*
President Edmund C. Sanford
Professor William E. Story, *Secretary*

Library Staff

Louis N. Wilson, *Librarian*

Assistants

Edith M. Baker, *Senior Assistant*
Helen J. Elliot, *Cataloguer*
Beatrice M. Abbott
Madge F. Trow
I. Marie Randall
Frances Huelster

The Library building is situated on the corner of Main and Downing streets. The Public Opening of the building was held January 14th, 1904. A full description of the building and of the Proceedings at the Opening will be found in the *Publications of the Clark University Library* for April, 1904 (Vol. 1, No. 3).

The College Library and study rooms occupy the lower floor of the new building, opened in September, 1910, and described in the College Record, July, 1910, Vol. 5, pp. 185–187.

The Library contains over 70,000 bound volumes and pamphlets, and the reading-room receives over 450 journals.

The books are grouped as follows:

A	Works of General Reference	L	Biography
		M	Anthropology
B	Journals	N	Education
C	Mathematics	O	General Science
CD	Math.-Physics	P	History
D	Physics		
DE	Physical Chemistry	R	Political and Social Science
E	Chemistry		Economics
F	Biology, Zoölogy, Botany, Physiology, Neurology	S	English
		T	Modern Languages
G	Geography	U	Classics
H	Pathology	W	Practical Arts
I	Psychology	X	Library Science
J	Philosophy	Y	Art
K	Religious Psychology	Z	Manuscripts

Tuesday and Friday mornings, each week, all books recently added to the library are placed upon a table in the Reference section where they remain for three days. This affords the members of the University and College an opportunity to examine the new books in all departments before they are placed upon the shelves for circulation.

About once a month, during term, by the courtesy of our booksellers, new books are placed for inspection on one of the tables in the Reference section. Any member of the University or College may recommend the purchase for the library of books thus displayed, and such recommendation will receive prompt attention.

All books are classified by the heads of departments and particular attention is paid to the needs of students engaged in research work. The library already possesses a good collection of complete sets of the best scientific periodicals. It makes liberal purchases for individual needs and supplements these by drawing upon the resources of the older and larger libraries through the inter-library loan system. During the past year 680 volumes were borrowed from, and 319 volumes lent to, other libraries. The number of books added each year is about four thousand volumes.

The publications of the Library, edited by the Librarian, and begun in October, 1903, are as follows:

VOL. I.

(1) Bibliography of the Published Writings of President G. Stanley Hall. (2) Bibliography of Child Study for the Year 1902. (3) Proceedings and Addresses at the Public Opening of the Library Building of Clark University, January 1904. (4) Bibliography of Child Study

for the Year 1903. (5) Preparing Manuscript for the Press. (6) Founder's Day, Clark University. (7) Bibliography of Child Study for the Year 1904. (8) The Probable Source of the Plot of Shakespeare's Tempest. (9) Public Opening of the Art Department of Clark University, Dec. 5, 1905.

VOL. 2.

(1) List of Books and Pictures in the Clark Memorial Collection (2) Bibliography of Child Study for the Year 1905. (3) A Few Titles in Child Study. (4) Proceedings at the First Annual Banquet of the New England Association of Alumni of Clark University, and at the Banquet of the Washington, D.C., Alumni Association, 1907. (5) Bibliography of Child Study for the Year 1906. (6) Bibliography of Child Study for the Year 1907. (7) The Outlook for Research (Founder's Day Address, February 1, 1911). (8) List of Papers in the Field of Religious Psychology Presented at Clark University. (9) List of Degrees Granted at Clark University and Clark College.

VOL. 3.

(1) The Relative Legibility of Different Faces of Printing Types. (2) Suggestions for a Model Private Library at Clark College. (3) Bibliographies on Experimental Pedagogy. (4) Further Suggestions for a Model Private Library at Clark College. (5) Bibliographies on Educational Psychology. (6) Representative Books in Child Study. (7) Twenty-Fifth Anniversary of Clark University, 1889–1914.

The books in the Art Department are accessible on application to the librarian, but, by the terms of the Founder's will, they cannot be taken from the building.

All the privileges of the Library are open to all members of the University, and each member has direct access to every book and journal.

The Library is open from 8 a.m. to 6 p.m. each week day from Sept. 1 to July 1. During July and August it is open from 8 a.m. to 5 p.m. from Mondays to Fridays, and on Saturdays from 8 a.m. to 12 m. The library is closed July 4th, Thanksgiving Day and Christmas Day.

Outside the University are found:

The Library of the American Antiquarian Society, organized in 1812, and containing over 125,000 volumes, accessible to all members of the University.

The Worcester Public Library, containing 600 newspapers and magazines and nearly 200,000 volumes, has, in the past, to some extent supplemented the scientific publications purchased by the University, and all its privileges are accessible without charge.

The Library of the Worcester District Medical Society of about 12,000 volumes, is also free to all members of the University.

LIBRARY RULES

No loud talking is allowed in any part of the Library.

Every book shall be returned at the end of one calendar month from the time at which it was taken out, but may be called in at any time at the discretion of the Librarian.

Current numbers of periodicals shall not be taken out until they have been in the Library ten days.

All dictionaries, cyclopædias, and books of general reference are permanently reserved.

Reserved books and current numbers of periodicals, exempt from circulation, may be taken out after 5 p.m., but must be returned before 9 o'clock the next morning, excepting that such books and periodicals may be taken out Saturdays at 12 o'clock, and may be kept until 9 o'clock the next Monday morning.

Readers must not write nor make any mark upon any book, manuscript, map, or other property belonging to the Library.

Any breach of the above Rules will involve suspension of the Library privileges until personally restored by the Librarian. All such cases shall be laid before the Library Committee at their next meeting.

In his last will and testament the Founder of the University bequeathed

"the sum of $100,000, as an endowment fund for the Art Department of said University, and said sum is to be held and kept sacred and intact as a principal not to be used or expended under any conditions; but the income, interest or proceeds thereof shall be used only in putting and keeping said works of art or others given or obtained for said department in good condition and in taking care of them; and then if there is a surplus of the income of said fund left, I will and direct that it be used in the purchase of additional works of art or of such matters as will add to the usefulness and efficiency of said Art Department."

Under these conditions a large room has been furnished and equipped on the upper floor of the Library Building. Upon the death of Mrs. Clark, those of the Founder's collections that were deemed most suitable for this purpose were arranged and displayed in this room, together with his most valuable books, which, by the conditions of the will, cannot be removed from the building. A complete catalogue of these books and paintings has been published in the PUBLICATIONS OF THE LIBRARY, Vol. 2, No. 1.

A Curator and Custodian have been appointed by the Board (see page 105) and all the collections are now accessible to visitors. The Art Department is open daily (except Sundays) from 9 a.m. to 5 p.m.

Three portraits and one landscape painting have been added to the collection:

1909. Portrait of the late Carroll D. Wright, President of the Collegiate Department from 1902 to 1909, by the late Frederick P. Vinton

of Boston. This painting was awarded the Temple Gold Medal at the 1909 Exhibition of the Pennsylvania Academy of Fine Arts.

1911. Portrait of G. Stanley Hall, President of Clark University, by the late Frederick P. Vinton of Boston.

1913. Landscape painting "Snowing" by Joseph H. Greenwood of Worcester.

1914. Portrait of Edmund C. Sanford, President of Clark College since 1909.

To commemorate the twenty-fifth anniversary of the University the Board of Trustees, early in 1914, commissioned Mr. Victor D. Brenner of New York to prepare a medal to mark that event. The medal is made of bronze and is three inches in diameter. On the observe is delineated the head of President Hall, and on the reverse a beautiful allegorical group symbolizing the spirit of the University, and the legend,

> "Knowledge is proud that he has learned so much,
> Wisdom is humble that he knows no more."

Scale models of the two new buildings and the University grounds have been made by T. J. McAuliffe and Son of Worcester, under the direction of the architects, Messrs. Frost and Chamberlain.

REGULATIONS

1. All requisitions for apparatus must be made through the Bursar's office upon printed blanks provided for that purpose and signed by a member of the staff.

2. So far as possible, orders for only the kind and amount of apparatus certain to be used during the year shall be placed; nothing shall be ordered for future years, and apparatus for research shall take precedence over that for teaching and illustration only.

3. Requisitions for repairs, furniture, plumbing and work about the buildings must be made through the Bursar's office in writing and with detail, and, when once passed upon, no change involving additional expense can be made in the requisition without the consent of the Finance Committee.

4. No unappropriated rooms and no part of the University grounds shall be used for any purpose, and appropriated rooms shall not be used for other purposes than the stated University work for which they were intended, without previous permission from the office.

5. Unless for special reasons, absence of instructors from their stated exercises or from town for two consecutive week days in term time should be announced at the office, and for longer absence permission should be obtained beforehand.

6. The Trustees desire that no Instructor, Docent, or

Fellow shall enter upon other engagements outside his proper work in the University of a kind or amount likely to lessen his full efficiency for science within the University.

7. Appropriations shall hereafter cover all apparatus and supplies of whatever nature for laboratories, for demonstration or illustration; all metal and carpenter work connected with the scientific activity of each department; and every form of special service. Appropriations, however, shall not hereafter cover orders for books or journals, which shall be submitted to the Library Committee.

8. The several appropriations made to individual instructors and others shall be the full and fixed limit of the liability of the University, to be on no account transcended; and for every excess over the appropriations, from whatever cause, the instructor making the order shall be personally responsible.

9. No order for any purpose shall be paid by the University, whether on appropriations or for general supplies, that has not passed through the Bursar's office.

10. The President, Professors, Assistant Professors and regular Instructors authorized by the Board to do graduate work, together with the Librarian, shall constitute the Faculty of the University. Its meetings shall be called and presided over by its President, or, in his absence, by a Professor whom he shall designate. The Faculty shall elect a Secretary and its records shall always be accessible to the Trustees. Its jurisdiction shall include all matters pertaining to the instruction, conduct and discipline of students, and such other duties as may be prescribed by the Trustees.

11. The President of the University shall make, at the October meeting of the Board, an annual report on the condition of the departments and their work during the year and shall have authority to require and receive rom all Instructors and Officers of the University and Library such rpoerts as he may deem necessary. A copy of these reports, including that of the Library, shall be deposited with the Mayorof the City.

12. The University Faculty shall have the oversight of all graduate work and shall recommend for the Mas ter's, Doctor's and all other graduate degrees upon such terms, conditions, and forms as it may determine, and exercise such other functions and responsibilities as are not expressly assigned to the Trustees or to the Collegiate Department.

13. The Custodian of the Art Collection shall have general oversight over its room in the Library Building and its contents, together with their care and use, under the direction and control of the Curator. The Curator shall from time to time submit to the Trustees his recommendations for the purchase of additional works of art from the income of the Art Fund, based on and together with the opinions of experts as to their value and desirability. All such purchases shall be approved by the Board of Trustees, or by such a committee of their members as they shall appoint for that purpose.

14. The President of the University shall make an annual report to the Trustees of the action of the Library Committee, of which he is Chairman, and this report, if approved, shall be filed and preserved.

DEGREES CONFERRED

On June 18, 1914, the University conferred degrees upon the following persons:

MASTER OF ARTS

Lawrence Augustus Averill
Thesis: Problems of the rural school system in New England

Walter Joseph Bankes
Thesis: Coöperation of the home and the school

Francis Corliss Berry
Thesis: Dental hygiene in schools

Setrak Krikor Boyajian
Thesis: Intervention in theory and practice

Thomas Isaacs Brown
Thesis: A study of the social condition of the colored population of Worcester

Earl Van Dusen Burdick
Thesis: The social aspect of school dramatics

Walter Guy Butler
Thesis: Hereditary pauperism

Edward Marion Augustus Chandler
Thesis: On the dynamics of ester hydrolysis by acids

George Allen Coe
Thesis: The public school teacher in Massachusetts

Harold Randolph Crosland
Thesis: The relative efficiency of imagery of different modalities in learning and remembering

Leo Henry Dawson
Thesis: On the viscosities of aqueous solutions of potassium chloride and of hydrochloric acid

Allan Dickie
Thesis: The Monroe Doctrine

Charles Anthony Donlon
Thesis: Commercial education

Oscar Lee Dustheimer

Thesis: The historical order of development and some applications of symmetric determinants

Baiten Hori

Thesis: Theories of attention

Merle Coe Knapp

Thesis: The qualities of bad air

Samuel Calmin Kohs

Thesis: The association method in its relation to the complex and complex indicators

Clarence McCormick

Thesis: On the theory of finite continuous groups

Floyd Marion McDowell

Thesis: The problem of the small college

Florence Mateer

Thesis: The psycho-clinician: Personality and training

George Winfield Morris

Thesis: The diplomatic relations between the United States and Russia

William Leander Muttart

Thesis: The psychological basis of asceticism

John Francis O'Connell

Thesis: Jesuit education

Joseph Vincent O'Connell

Thesis: Latin in the secondary schools

Gault W. Pleasant

Thesis: Boys' organizations and their educational value

John Henry Purnell

Thesis: The model school as an educational factor

Clarence Prouty Shedd

Thesis: The origin and development of the College Young Men's Christian Association Movement in North America

William Roderick Sherman

Thesis: The diplomatic relations of the United States with Mexico since 1848

Curtis T. Williams

Thesis: Animal totemism and tabu in literature

DOCTOR OF PHILOSOPHY

James Atkins Bullard

Dissertation: On the structure of finite continuous groups

Ivy Gertrude Campbell

Dissertation: The social as the leading factor in personality

Robert Sidney Ellis

Dissertation: The attitude toward death and the types of belief in immortality

Marion Myrl Harrison

Dissertation: The dynamics of the formation and decomposition of tertiary amyl esters

Cecil Kenyon Lyans

Dissertation: The doctrine of formal discipline

Ernest Cl'fton McDougle

Dissertation: A contribution to the pedagogy of arithmetic

Wallace Frank Powers

Dissertation: An experimental study of transient induced currents in cylindrical cores

Lillian Rosanoff

Dissertation: Theory of the catalysis of sugar inversion by acids

John Frederic William Schulze

Dissertation: A study of fractional distillation

PUBLICATIONS

A Register and Official Announcement is issued each year in February or March.

In the years 1890, 1891, 1893, and 1902, the annual Report of the President to the Board of Trustees was printed.

A Summer School was held for nine years ending in 1903, and in such years a Summer School Programme was issued.

In July, 1899, the University observed its tenth anniversary, and published the following volume:

Clark University, 1889-1899. Decennial Celebration. 8 x 11 in., pp. 566. Published for the University. Price, $5.00. Contains the lectures delivered by Professors Picard, Boltzmann, Ramon y Cajal, Mosso and Forel at the Decennial Celebration, July, 1899; also reports by the heads of departments on their aims and ideals, with a list of past and present members of the University and the titles of their published papers.

Proceedings of the Child Conference for Research and Welfare. Conferences held at Clark University in the summers of 1909 and 1910. Vol. 1, 1909, 257 p., contains 48 papers on problems relating to child welfare. Vol. 2, 1910, 287 p., contains 34 papers, on similar subjects. The papers in Vol. 1 were reprinted from the Pedagogical Seminary for September and December 1909, but those in Vol.

2, with one exception, have not been printed elsewhere. Price $2.00 per volume in paper, $2.50 in cloth. Louis N. Wilson, Publisher, Worcester, Mass.

In connection with the celebration of the 20th anniversary of Clark University in September, 1909, conferences and lectures were held by the several departments to which distinguished scientists and educators in this and other countries contributed. Two volumes of these lectures have been published with the titles:

Lectures and Addresses Delivered before the Departments of Psychology and Pedagogy in Celebration of the 20th Anniversary of the Opening of Clark University. 175+80 pages. Price $2.00.

Lecturers Delivered at the Celebration of the Twentieth Anniversary of the Foundation of Clark University under the Auspices of the Department of Physics. 161 pages. Price $2.00.

Japan and Japanese-American Relations, pp. xi, 348, New York: G. E. Stechert and Company, 1912, $2.50. Edited by Professor George H. Blakeslee. The volume contains twenty-two of the addresses delivered by the experts, both Japanese and American, who met at the Clark University Historical Conference, November, 1911. Each of the chapters deals with a distinct topic; together they cover progressively the field of what is both most interesting and most vital in the present national and international situation of Japan.

Recent Developments in China, pp. xi, 413, New York: G. E. Stechert and Company, 1913, $2.50. Edited by Professor George H. Blakeslee. These twenty-two addresses, given at the Clark University Conference, November, 1912, by Chinese and Americans who have a recent, intimate and authoritative knowledge of China, present the underlying causes of the Revolution, and the progress and

problems of the Chinese people in government, education, social welfare, industry and religion.

LATIN AMERICA, pp. xii, 388, New York: G. E. Stechert and Company, 1914, $2.50. Edited by Prof. George H. Blakeslee. Twenty-nine addresses given at the Clark University Conference, November, 1913.

These addresses, by well-known authorities upon Latin-American affairs, including a large proportion of citizens of Latin-American countries, present a critical study of the salient features of the life of the American Republics to the south of us, and of their relations to the United States. Among the topics especially emphasized are, the Monroe Doctrine, the Mexican Situation, Trade and Business Relations, Diplomatic Relations, and Education.

JOURNALS CONNECTED UNOFFICIALLY WITH THE DEPARTMENTS

THE AMERICAN JOURNAL OF PSYCHOLOGY. This journal was commenced in November, 1887, and is now edited by G. Stanley Hall, E. C. Sanford, E. B. Titchener (Cornell University), and J. W. Baird, with the assistance of an international board of co-operators. Each volume contains four numbers—issued in January, April, July and October. Besides original articles, a considerable portion of its space is devoted to careful digests of the important literature in its field. Price $5 per volume; single numbers, $1.50. Florence Chandler, Publisher, Worcester, Mass.

THE PEDAGOGICAL SEMINARY. This journal was begun in January, 1891, and is edited by the President of the University with the assistance of William H. Burnham, Professor of Pedagogy. It is an international record

of educational literature, institutions and progress, and is devoted solely to the highest interest of education in all grades, with digests of important literature of all countries. It is the organ of the Educational Department of the University. Each volume contains four numbers—issued in March, June, September and December. Price $5 per volume; single numbers, $1.50. Florence Chandler, Publisher, Worcester, Mass.

Journal of Religious Psychology (including its anthropological and sociological aspects). This journal was begun in May, 1904, and is now in its seventh volume. It is edited by President G. Stanley Hall. The aim of this journal is to publish original material from all parts of the field of religious psychology. Special attention is devoted to the literature of the subject, both books, monographs and articles in current periodicals. It is published irregularly, each volume, of four numbers, containing about 500 pages. Price $3.00 per volume; single copies $1.00. Louis N. Wilson, Publisher, Worcester, Mass.

The Journal of Race Development. This journal was begun in July, 1910 and is edited by Dr. Blakeslee and President Hall with the coöperation of a board of twenty-one contributing editors. It offers itself as a forum for the discussion of the problems which relate to the progress of races and states generally considered backward in their standard of civilization. Issued quarterly, each number containing about 125 pages. Price $2.00 per volume; 50 cts. per number. Louis N. Wilson, Publisher, Worcester, Mass.

UNIVERSITY COLORS

EMERALD GREEN AND WHITE

To be worn in the hood as a green chevron
on a white field

Clark University
in the City of Worcester
Massachusetts

Register and Twenty-eighth Official Announcement

1916

CLARK UNIVERSITY

WORCESTER, MASSACHUSETTS

REGISTER AND TWENTY-EIGHTH OFFICIAL ANNOUNCEMENT

WORCESTER, MASSACHUSETTS
Published for the University
February, 1916

BOARD OF TRUSTEES

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CALENDAR 1916–1917

1916		
FEB. 1	Tuesday	Founder's Day*
FEB. 22	Tuesday	Washington's Birthday
APRIL 3	Monday	Spring Recess
APRIL 8	Saturday	
APRIL 19	Wednesday	Patriots' Day
MAY 30	Tuesday	Memorial Day
JUNE 15	Thursday	Twenty-seventh academic year closes

Summer Vacation of 14 Weeks

SEPT. 21	Thursday	Twenty-eighth academic year begins
OCT. 12	Thursday	Columbus Day
NOV. 30	Thursday	Thanksgiving Day
DEC. 23	Saturday	Christmas Recess
1917		
JAN. 6	Saturday	
FEB. 1	Thursday	Founder's Day*
FEB. 22	Thursday	Washington's Birthday
APRIL 2	Monday	Spring Recess
APRIL 7	Saturday	
APRIL 19	Thursday	Patriots' Day
MAY 30	Wednesday	Memorial Day
JUNE 21	Thursday	Twenty-eighth academic year closes

*Not a holiday

MEMBERS

STAFF

GRANVILLE STANLEY HALL, PH.D., LL.D. 156 Woodland St.
President of the University and Professor of Psychology

A.B., Williams College, 1867; A.M., 1870; Ph.D., Harvard University, 1878; Lecturer in Harvard and Williams Colleges, 1880–81; Professor of Psychology, Johns Hopkins University, 1881–88; President and Professor of Psychology, Clark University, 1888–; LL.D., University of Michigan, 1888, Williams College, 1889, and Johns Hopkins University, 1902; Chairman of the Library Committee and Curator of the Art Collection, Clark University. Member of the National Academy of Sciences; Resident Member of the Massachusetts Historical Society.

WILLIAM EDWARD STORY, PH.D. 17 Hammond St.
Professor of Mathematics and Secretary of the Faculty

A.B., Harvard University, 1871; Ph.D., University of Leipzig, 1875; Parker Fellow (Harvard), 1874–75; Tutor of Mathematics, Harvard University, 1875–76; Associate, Assistant Professor, and Associate Professor of Mathematics, Johns Hopkins University, 1876–89; Professor of Mathematics, Clark University, 1889–; Professor of Mathematics, Clark College, 1902–07. Member of the National Academy of Sciences; Member of the London Mathematical Society; Resident Fellow of the American Academy of Arts and Sciences.

EDMUND CLARK SANFORD, PH.D., SC.D., LL.D.
Lecturer on College Administration 160 Woodland St.

A.B., University of California, 1883; Fellow, Johns Hopkins University, 1887; Ph.D., Johns Hopkins University, 1888; Instructor in Psychology, Johns Hopkins University, 1888; Instructor in Psychology, Clark University, 1889-92; Assistant Professor 1892–1900; Professor of Psychology, Clark College, 1903–07; Professor of Experimental and Comparative Psychology, Clark University, 1900–09; Lecturer on College Administration, 1909–; Sc.D, Hobart College, 1909; President of Clark College, 1909–; LL.D., University of California, 1912.

ARTHUR GORDON WEBSTER, PH.D., SC.D., LL.D.
Professor of Physics 66 West St.

A.B., Harvard University, 1885; Instructor in Mathematics, Harvard University 1885–86; Parker Fellow, 1886–89; Student, Universities of Berlin, Paris, Stockholm, 1886–90; Ph.D., University of Berlin, 1890; Docent in Physics, Clark University, 1890–

92; Assistant Professor, 1892–1900; Professor, 1900–; Professor of Physics, Clark College, 1902–07; Director of Physical Laboratories; Sc.D., Tufts College, 1905; LL.D., Hobart College, 1908. Member of the National Academy of Sciences; Resident Fellow of the American Academy of Arts and Sciences; Member of the American Philosophical Society.

HENRY TABER, PH.D.

Professor of Mathematics — 26 Dayton St.

Ph.B., Yale University, 1882; Ph.D., Johns Hopkins University, 1888; Assistant in Mathematics, Johns Hopkins University, 1888–89; Docent in Mathematics, Clark University, 1889–92; Assistant Professor, 1892–1903; Professor, 1903–; Member of the London Mathematical Society; Resident Fellow of the American Academy of Arts and Sciences.

WILLIAM HENRY BURNHAM, PH.D.

Professor of Pedagogy and School Hygiene — 767 Main St.

A.B., Harvard University, 1882; Instructor in Wittenberg College, 1882–83; Instructor, State Normal School, Potsdam, N. Y., 1883–85; Fellow, Johns Hopkins University, 1885–86; Ph.D., 1888; Instructor in Psychology, 1888–89; Docent in Pedagogy, Clark University, 1890–92; Instructor, 1892–1900; Assistant Professor, 1900–06; Professor, 1906–.

GEORGE HUBBARD BLAKESLEE, PH.D.

Professor of History and International Relations — 21 Downing St.

A.B., Wesleyan University, 1893; A.M., Harvard University, 1899; Ph.D., 1903; Student, Johns Hopkins University, 1893–94; Parker Fellow, Harvard, 1901–02; Student, Universities of Berlin, Leipzig, and Oxford, 1901–03; Instructor in History, Clark College, 1903–04; Assistant Professor, 1904–09; Professor, 1909–; Instructor in History, Clark University, 1905–11; Professor, 1911–.

JOHN WALLACE BAIRD, PH.D.

Professor of Experimental Psychology — 5 Lucian St.

A.B., University of Toronto, 1897; Student, University of Leipzig, 1898–99; Fellow, University of Wisconsin, 1899–1901; Fellow, Cornell University, 1901–02; Ph.D., 1902; Assistant in Psychology, 1902–03; Carnegie Research Assistant, 1903–04; Instructor in Psychology, Johns Hopkins University, 1904–06; Instructor in Psychology, University of Illinois, 1906–07; Assistant Professor, 1907–February, 1910; Assistant Professor of Experimental Psychology, Clark University, February, 1910–February, 1913; Professor, February, 1913–.

RALPH STAYNER LILLIE, PH.D

Professor of Biology — 21 Dayton St.

A.B., University of Toronto, 1896; Student, University of Michigan, 1896–97; Fellow, University of Chicago, 1898–1901; Ph.D., 1901; Assistant in Physiology, Harvard University, 1901–02; Instructor, University of Nebraska, 1902–03; Adjunct Professor, 1903–04; Carnegie Research Assistant at Zoölogical Station, Naples, 1904–05; In-

structor in Physiology, Harvard University, 1905–06; Johnston Scholar, Johns Hopkins University, 1906–07; Instructor in Physiological Zoölogy, University of Pennsylvania, 1907–12; Assistant Professor of Experimental Zoölogy, 1912–13; Instructor in General and Comparative Physiology, Marine Biological Laboratory, Woods Hole, Mass., 1902–; Professor of Biology, Clark University, October 1913–.

CHARLES A. KRAUS, PH.D.
Professor of Chemistry — 11 Downing St.

B.S., University of Kansas, 1898; Fellow in Physics, Johns Hopkins University, 1899–1900; Research Fellow, Kansas University, 1900–01; Instructor in Physics, University of California, 1901–04; Research Assistant, Massachusetts Institute of Technology, 1904–08; Ph.D., 1908; Research Associate, 1908–12; Assistant Professor of Physical Chemical Research, 1912–14; Professor of Chemistry and Director of the Chemical Laboratories, Clark University, 1914–.

JOSEPH DE PEROTT
Lecturer in Mathematics — 5 Hawthorn St.

Student, Universities of Paris and Berlin, 1877–80; Docent in Mathematics, Clark University, 1890–1904; Lecturer, 1904–.

LOUIS N. WILSON, LITT.D. — 11 Shirley St.
Librarian of the University and Custodian of the Art Collection

Litt.D., Tufts College, 1905.

FRANK HAMILTON HANKINS, PH.D.
Assistant Professor of Sociology — 4 Cabot St.

A.B., Baker University, 1901; Student, Columbia University, 1903–04; Scholar in Sociology, 1904–05; Fellow in Statistics, 1905–06; Student, 1907–08; Ph.D., Columbia University, 1908; Instructor in Economics, Clark College, 1906–07; Assistant Professor, 1908–13; Professor of Political and Social Science, 1913–; Instructor in Economics and Sociology, Clark University, 1906–07; 1908–15; Assistant Professor of Sociology, 1915–.

JOHN CHARLES HUBBARD, PH.D.
Instructor in Physics — 20 Downing St.

B. S., University of Colorado, 1901; Scholar in Physics, Clark University, and Assistant to Professor Webster, 1901–02; Fellow, 1902–04; Ph. D., Clark University, 1904; Instructor in Physics, Simmons College, 1904–05; Asssistant Professor of Physics, New York University, 1905–06; Assistant Professor of Physics, Clark College, 1906–11; Professor, 1911–; Honorary Fellow in Physics, Clark University, 1907–09; Instructor, 1910–.

FRANK BLAIR WILLIAMS, PH.D.
Instructor in Mathematics — 2 Isabella St.

C.E., University of Missouri, 1890; M. S., 1893; Engineering Work with the Mississippi River Commission, 1890–92; Teaching Fellow in Mathematics, University of

Missouri, 1892–93; Survey Work with the Mississipi River Commission, 1894–95; United States Assistant Engineer in Tennessee River Improvement, 1895–97; Scholar in Mathematics, Clark University, 1897–98; Fellow, 1898–1900; Ph.D., 1900; Assistant Professor of Civil Engineering, Union College, 1900–05; Assistant Professor of Engineering and Mathematics, 1905–06; Professor of Engineering Mathematics, 1906–07; Assistant Professor of Mathematics, Clark College, 1907–08; Professor, 1908–; Honorary Fellow in Mathematics, Clark University, 1909–10; Instructor, 1910–.

Annual Appointments

Edward Cowles, M.D., LL.D., Boston
Non-Resident Lecturer in Psychiatry

A.B., Dartmouth College, 1859; A.M., 1863; Medical House Pupil, Retreat for the Insane, Hartford, Conn., 1860–62; M.D., Dartmouth Medical School, 1863; M.D., College of Physicians and Surgeons, New York, 1863; Medical Corps, United States Army, 1863–72; Resident Physician and Superintendent, Boston City Hospital, 1872–79; Medical Superintendent, McLean Hospital, Waverley, Mass., 1879–1903; Lecturer on Mental Diseases, Dartmouth Medical School, 1885–86; Professor of Mental Diseases, 1886–; Fellow by Courtesy, Johns Hopkins University, 1887-88; Clinical Instructor in Mental Diseases, Harvard Medical School, 1888–; LL.D., Dartmouth College, 1890; Non-Resident Lecturer in Psychiatry, Clark University, 1903–.

Samuel Weiller Fernberger, Ph.D.
Assistant Professor of Experimental Psychology 767 Main St.

B.S., University of Pennsylvania, 1908; M.A., 1909; Ph.D., 1912; Assistant in Psychology, University of Pennsylvania, 1908–09; Instructor, 1910–12; Instructor in Experimental Psychology, Clark University, 1912–15; Assistant Professor, 1915–

Norman Scott Brien Gras, Ph.D.
Instructor in History 12 Tirrell St.

A.B., Western University, 1906, A.M. 1906; A.M., Harvard University, 1909; Ph.D., 1912; University Scholar, Harvard University, 1907–08; Goodwin Fellow, 1908–09; Kirkland and Sheldon Traveling Fellow (Europe), 1910–12; Instructor in Economics, Western University, 1905–06; Assistant in History, Harvard University, 1909–10; Assistant Professor of History, Clark College, 1912–; Lecturer in History. Clark University, 1913–15; Instructor, 1915–.

Karl Johan Karlson, Ph.D.
Lecturer in Philosophy 6 Wyman St.

A.B., Clark College, 1909; Scholar in Psychology, Clark University, 1909–10; A.M., 1910; Fellow, 1910–12; Ph.D., 1912; Honorary Fellow in Psychology, Clark University, 1912–14; Lecturer in Philosophy, 1914–.

BENJAMIN SHORES MERIGOLD, PH.D.

Instructor in Chemistry — 34 Chatham St.

A. B., Harvard University, 1896; A.M., 1897; Ph.D., 1901; Assistant in Chemistry, Harvard University, 1896–1900; Instructor in Chemistry, Worcester Polytechnic Institute, 1900–03; Assistant Professor of Chemistry, Clark College, 1903–08; Professor, 1908–; Instructor in Chemistry, Clark University, 1905–12, 1915–.

JAMES PERTICE PORTER, PH.D.

Instructor in Psychology — 209 Lovell St.

A.B., Indiana University, 1898; A.M., 1901; Instructor in Psychology, 1900–03; In charge of work in Neurology, Indiana University Biological Station, 1901 and 1903; Honorary Fellow in Psychology, Clark University, 1903–09; Ph.D., 1906; Instructor in Psychology, Clark College, 1903–07; Assistant Professor, 1907–12; Dean of the Faculty, 1909–; Lecturer in Psychology, Clark University, February–June, 1910; Instructor, 1910–12, 1915–; Professor of Psychology, Clark College, 1912–.

AMY ELIZA TANNER, PH.D.

Research Assistant to President Hall — 48 Downing St.

A.B., University of Michigan, 1893; Scholar, University of Chicago, 1894–95; Fellow, 1895–98; Ph.D., University of Chicago, 1898; Associate in Philosophy, 1898–1902; Professor of Philosophy, Wilson College, 1903–07; Honorary Fellow in Psychology, Clark University, 1907–09; Lecturer in the Children's Institute, 1909–11; Research Assistant to President Hall, 1911–.

GEORGE FREDERIC WHITE, PH.D.

Docent in Biological Chemistry — 1 Lucian St.

S.B., Massachusetts Institute of Technology, 1906; Ph.D. Johns Hopkins University 1910; Assistant in Analytical and Organic Chemistry, Massachusetts Institute of Technology, 1906–08; Fellow, Johns Hopkins University, 1909–10; Associate Professor of Chemistry, Richmond College, 1910–12; Chief Chemist, Woods Hole Laboratories of the United States Bureau of Fisheries, 1911–12; Instructor in Organic Chemistry, Clark College, 1912–13; Assistant Professor, 1913–.

HONORARY FELLOWS

JAMES MACE ANDRESS, A.M.

Honorary Fellow in Pedagogy — 37 Circuit Ave.

B.Pd., Michigan State Normal College, 1905; A.B., 1905; Graduate Student, University of Chicago, 1905–06; Ph.M., 1906; Instructor in History and Education Manchester College, 1906–07; Scholar in Education, Harvard University, 1907–08; A.M., 1908; Instructor in Educational Psychology, History of Education, Hygiene, State Normal School, Worcester, Mass., 1908–December 1915; Student in Psychology, Clark University, 1913–14; Honorary Fellow in Pedagogy, 1914–; Head of Department of Psychology, Boston Normal School December 1915–.

GUSTAVE ALEXANDER FEINGOLD, PH.D., Hartford, Connecticut
Research Assistant in Experimental Psychology
15 Freeland St.

B.S., Trinity College, 1911; Terry Traveling Fellow, 1911–12; M.S., 1912; A.M., Harvard University, 1912; Fellow in Psychology and Assistant in Philosophy 1912–13; Assistant in Psychology, 1913–14; Ph.D., 1914.

IRVING ANGELL FIELD, PH.D., Auburn
Honorary Fellow in Biology

B.S., Denison University, 1903; Instructor in Ornithology, 1902–03; Assistant in Zoölogy,Harvard University, 1903–05; Austin Teaching Fellow, 1905–06; Professor of Chemistry and Biology, Western Maryland College, 1906–11; A.M., Harvard University, 1912; Instructor in Biology, Clark College, 1911–13; Honorary Fellow in Biology, Clark University, 1911–; Ph.D., 1913; Assistant Professor of Biology, Clark College, 1913–.

RALPH GIBNEY HURLIN, PH.D.
Honorary Fellow in Biology 2 Woodbine St.

A.B., Brown University 1912; A.M., 1913; Oliver Cromwell Gorton Arnold Fellow and Assistant in Elementary Biology, 1913–15; Ph.D., 1915; Instructor in Biology, Clark College, 1915–.

JAMES EDMUND IVES, PH.D.
Honorary Fellow in Physics 1030 Main St.

Assistant Curator, Academy of Natural Sciences, Philadelphia, 1887–93; Instructor in Physics, Drexel Institute, 1893–97; Jessup Student, Academy of Natural Sciences, Philadelphia, 1887–91; Student in Histology and Embryology, University of Pennsylvania, 1888–89; Student in Mathematics, 1893–95; Student in Physics, Cavendish Laboratory, Cambridge, England, 1896; Scholar in Physics, Clark University, 1897–98; Fellow, 1898–1901; Ph.D., 1901; Instructor in Physics, University of Cincinnati, 1901–03; Assistant Professor, 1905–10; Associate Professor, 1910–12; Honorary Fellow in Physics, Clark University, 1912–.

YOSHIHIDE KUBO, PH.D., Tokyo, Japan
Honorary Fellow in Psychology 103 May St.

Graduate, Imperial University, Tokyo, Japan, 1909; Student in University Hall, Tokyo, Japan, 1910–12; Fellow in Psychology, Clark University, 1913–15; Ph.D., 1915.

CAREY EYSTER MELVILLE, A.B.
Honorary Fellow in Mathematics 16 Isabella St.

A.B., Northwestern University, 1901; Fellow in Mathematics, 1901–02; Graduate Student in Mathematics, Johns Hopkins University, 1902–03; Instructor in Mathematics, Case School of Applied Science, 1903–06; Honorary Fellow in Mathematics, Clark University, 1906–; Assistant in Mathematics, Clark College, 1906–09; Instructor, 1909–10: Instructor in Mathematics and Physics, 1910–11; Assistant Professor of Mathematics 1911–.

Leslie Custer Wells, A.M.
Honorary Fellow in History — 10 Lowell St.

A.B., A.M., Tufts College, 1901; Instructor in French, Tufts College, 1902–03; Graduate Student, Harvard University, 1903; University of Paris and Collège de France, 1905–06; Instructor in French, Clark College, 1903–04; Instructor in French and Spanish, 1904–08; Assistant Professor of Romance Languages, 1908–13; Professor of French and Spanish, 1913–.

Fellows

Vernon Charles Allison, A.B., Pittsburg, Kansas
Fellow in Chemistry — 938 Main St.

A.B., State Manual Training Normal School, Pittsburg, Kansas, 1914; Scholar in Chemistry, Clark University, 1914–15.

Adelbert Ames, Jr., LL.B., Lowell
Fellow in Experimental Psychology — 15 King St.

A.B., Harvard University, 1903; LL.B., Harvard Law School, 1906; Scholar in Psychology, Clark University, 1914–15.

Raymond Bellamy, A.M., Moores Hill, Indiana
Fellow in Psychology — 28 Shirley St.

A.B., Moores Hill College, 1910; Professor of Chemistry and Physics, 1910–12; Fellow in Psychology, Clark University, 1912–13; A.M., 1913; Professor of Education, Emory and Henry College, 1913–15.

Theodore Benda, A.M., Shelby, Nebraska
Fellow in Psychology — 103 May St.

A.B., University of Nebraska, 1908; A.M., 1914.

John Egbert Bishop, A.M., Forest Grove, Oregon
Fellow in Chemistry — 84 Woodland St.

A.B., Pacific University, 1914; Scholar in Chemistry, Clark University, 1914–15; A.M., 1915.

Irving Thayer Boardman, A.M., Providence, Rhode Island
Fellow in Pedagogy — 28 Hollywood St.

A.B., Brown University, 1914; A.M., 1915.

Hagop Boghoss Boghossian, A.M.
Fellow in Pedagogy — 37 Clifton St.

A.B., Apostolic College, Konia, Asia Minor, Turkey, 1911; Instructor, 1911–14; A.M., Teachers College, Columbia University, 1915.

ETHEL BOWMAN, A.M., Auburndale
Fellow in Experimental Psychology 767 Main St.

A.B., Wellesley College, 1900; Graduate Assistant in Psychology, 1904–05; A.M., 1907; Assistant, 1910–12; Instructor, 1912–14; Scholar in Psychology, Clark University, 1914–15.

JAMES FURMAN BROOKS, A.B., Spartanburg, South Carolina
Fellow in Psychology 5 May St.

A.B., University of South Carolina, 1914.

SAMUEL ALLEN BURGESS, LL.B., St. Louis, Missouri
Fellow in Psychology 6 Lucian St.

A.B., Washington University, 1900; LL.B., 1902; President of Graceland College, 1913–15.

ARTHUR WALLACE CALHOUN, A.M., Mosgrove, Pennsylvania
Fellow in Sociology 2 Ripley Place

A.B., University of Pittsburgh, 1906; Professor of English and Philosophy, New Windsor College, 1906–07; Professor of Latin and History, Normal School, St. Petersburg, Fla., 1907–09; Instructor in German and History, Florida State College for Women, 1910–11; Professor of Philosophy and Social Science, Lenox College, 1912–13; A.M., University of Wisconsin, 1913; Professor of Social Science, Maryville College, 1913–15.

MANMATH NATH CHATTERJEE, A.M., Bengal, India
Fellow in History 15 Richards St.

Student, Punjub University, India, 1906–08; University of Glasgow, 1908–12; Scholar in History, Clark University, 1914–15; A.M., 1915.

LOUIS DAVID COVITT, A.M., Lexington, Kentucky
Fellow in Psychology 50 Woodland St.

A.B., Kentucky State University, 1913; Fellow in Psychology, Clark University, 1914–; A.M., 1915.

HAROLD RANDOLPH CROSLAND, A.M., Orangeburg, South Carolina
Fellow in Experimental Psychology 815 Main St.

A.B., University of South Carolina, 1913; Fellow in Psychology, Clark University, 1913–; A.M., 1914.

HERBERT KIMBALL CUMMINGS, M.S., West Boylston
Fellow in Physics 24 Beaver St.

B.S., Worcester Polytechnic Institute, 1910; Instructor in Physics and Chemistry, Alfred University, 1910–11; Instructor in Physics, Worcester Polytechnic Institute, 1911–15; Student in Physics, Clark University, 1911–13; Scholar, 1913–15; M.S., University of Chicago, 1915.

EDWARD HENRY DARBY, A.M.
Fellow in Chemistry — 5 Holland Road

A.B., Clark College, 1914; Scholar in Chemistry, Clark University, 1914–15; A.M., 1915.

LEO HENRY DAWSON, A.M., Medfield
Fellow in Physics — 14 Kenwood Ave.

A.B., Clark College, 1912; Scholar in Chemistry, Clark University, 1913–14; A.M., 1914; Fellow, 1914–15.

WILLIAM LEARNED DEALEY, A.M., Providence, Rhode Island
Fellow in Psychology — 90 Florence St.

A.B., Brown University, 1913; A.M., 1913; Fellow in Psychology, Clark University. February 1913–.

WILBUR BROOKS DEXTER, A.M.
Fellow in Chemistry — 7 West Oberlin St.

B.S., Colby College, 1914; Scholar in Chemistry, Clark University, 1914–15; A.M., 1915.

LUCILE DOOLEY, A.M., Knoxville, Tennessee
Fellow in Psychology — 6 Charlotte St.

A.B., Randolph-Macon Woman's College, 1905; Teaching Fellow, University of Tennessee, 1914–15; A.M., 1915.

AUBREY AUGUSTUS DOUGLASS, A.M., Emporia, Kansas
Fellow in Pedagogy — 90 Florence St.

A.B., Kansas State Normal School, 1912; Scholar in Pedagogy, Clark University, 1914–15; A.M., 1915.

ROBERT NEWTON ELLIOTT, A.M., Moundville, Alabama
Fellow in Pedagogy — 17 Abbott St.

A.B., Emory and Henry College, 1910; Fellow in Pedagogy, Clark University, 1914–; A.M., 1915.

JOSEPH KIRK FOLSOM, A.M., Newark, New Jersey
Fellow in Sociology — 24 Beaver St.

B.S., Rutgers College, 1913; Instructor in Physics, St. Lawrence University, March-June, 1914; Scholar in Sociology, Clark University, 1914–15; A.M., 1915.

CARROLL NEWMAN GIBNEY, A.B., Antrim, New Hampshire
Fellow in Pedagogy — 36 Gates St.

A.B., Clark College, 1913.

ESTHER MAUD GREISHEIMER, B.S. in E., Chillicothe, Ohio
Fellow in Biology — 46 May St.

B.S., in E., Ohio University, 1914; Fellow in Biology, Clark University, 1914–.

ARTHUR OLIN GRIGGS, PH.B., Westford, Connecticut
Fellow in Pedagogy — 154 Winfield St.

Ph.B., Wesleyan University, 1898; Professor of Mathematics, Virginia Union University, 1903–05; Scholar in Pedagogy, Clark University, 1906–07; 1910–11; Fellow, 1911–12; Student, 1912–13; Fellow, 1914–.

BAITEN HORI, A.M., Tokyo, Japan
Fellow in Experimental Psychology — 91 Lovell St.

Graduate, Keiogijuku University, Tokyo, Japan, 1911; Scholar in Psychology, Clark University, 1912–13; Fellow, 1913–; A.M., 1914.

EDWIN ELMORE JACOBS, PH.M., Ashland, Ohio
Fellow in Sociology — 54 Beaver St.

Ph.B., Wooster University, 1901; Ph.M., Mount Union College, 1904; Professor of Biology, Ashland College, 1904–08; Acting President, 1908–11; Dean and Professor of Biology, 1911–15.

PEYSAH LEYZERAH
Fellow in Mathematics — 81 Temple St.

Graduate, Dinaburg Real Gymnasium, 1911; Student in Mathematics, Clark University, 1912–13; Fellow, 1913–.

CLARENCE MCCORMICK, A.M., Arkansas City, Kansas
Fellow in Mathematics — 29 Charlotte St.

A.B., University of Kansas, 1913; Fellow in Mathematics, Clark University, 1913–; A.M., 1914.

HERSCHEL THURMAN MANUEL, A.M., Greencastle, Indiana
Fellow in Psychology — 23 Maywood St.

A.B., DePauw University, 1909; Fellow in Education, University of Chicago, 1913–15; A.M., 1914; Instructor in Psychology and Pedagogy, Clark College, 1915–.

FLORENCE MATEER, A.M., Paoli, Pennsylvania
Fellow in Pedagogy — 48 Downing St.

Graduate, State Normal School, West Chester, Pa., 1906; Student, University of Pennsylvania, 1912–13; Research Assistant in Psychological Laboratory of the Vineland Training School, 1911–13; Scholar in Psychology, Clark University, 1913–14; A.M., 1914; Fellow, 1914–.

MAURICE WALTER MEYERHARDT

Fellow in Psychology — 5 Clayton St.

Student at Koelnisches Gymnasium, Berlin, 1880–87; Student in Psychology, Clark University, 1903–04; 1911–12; Scholar, 1904–07; Fellow, 1907–09; Honorary Fellow, 1909–11; Fellow, 1914–.

WILLIAM BARNARD MOONEY, A.B., Greeley, Colorado

Fellow in Psychology — 6 Downing St.

Pd.B., Colorado State Teachers College, 1902; Fellow in Education, 1902–04; Pd.M., 1904; Supervisor of Training School, State Normal School, Spearfish, South Dakota, 1904–08; Professor of School Administration, Colorado State Teachers College, 1908–; A.B., 1910.

FRANCIS JOHN O'BRIEN, A.M.

Fellow in Experimental Psychology and Research Assistant to Dr. Baird — 69 East Central St.

A.B., Holy Cross College, 1912; Scholar in Psychology, Clark University, 1912–13; A.M., 1913; Fellow, 1913–.

EDWARD BATES PECK, M.S., Spencer

Fellow in Chemistry — 94 Woodland St.

Ph.B., Brown University, 1912; Assistant in Chemistry, Worcester Polytechnic Institute, 1912–13; M.S., Massachusetts Institute of Technology, 1914; Fellow in Chemistry, Clark University, 1914–.

SAMUEL ERNEST POND, A.B., Woonsocket, Rhode Island

Fellow in Biology — 24 Beaver St.

A.B., International Y.M.C.A. College, Springfield, 1912.

DAVID WEIMER RIAL, B.S., Greensburg, Pennsylvania

Fellow in Psychology — 23 Maywood St.

B.S. in Chem., Lafayette College, 1910; Instructor in Natural Sciences, Pennsylvania State Normal School, 1912–15; B.Pd., 1915.

WINIFRED V. RICHMOND, A.M., Athens, Ohio

Fellow in Pedagogy — 6 Charlotte St.

B.S. in E., Ohio University, 1910; Scholar in Pedagogy, Clark University, 1914–15; A.M., 1915.

CHARLES BUNSEN SHAW, A.M., Torrington, Connecticut

Fellow in Pedagogy — 17 Charlotte St.

A.B., Clark College, 1914; Scholar in Pedagogy, Clark University, 1914–15; A.M., 1915; Fellow in Pedagogy, 1915–January 1916; Reader in English, Clark College, 1915–January 1916.

HAROLD FREDERIC STIMSON, PH.D., Rochdale — 70 Woodland St.
Fellow in Physics and Research Assistant to Dr. Webster

A.B., Clark College, 1910; Scholar in Physics, Clark University, 1910–11; A.M., 1911; Fellow in Physics and Research Assistant to Dr. Webster, 1911–; Ph.D., 1915.

ROBERT BROWN TEACHOUT, A.M., South Lancaster
Fellow in Experimental Psychology — 29 Tirrell St.

A.B., Dartmouth College, 1914; A.M., 1914; Fellow in Psychology, Clark University, 1914–.

LOUIS THOMPSON, A.M., South Haven, Michigan
Fellow in Physics — 982 Main St.

B.S., Kalamazoo College, 1914; Scholar in Physics, Clark University, 1914–15; A.M., 1915.

MARY TREUDLEY, A.M., Athens, Ohio
Fellow in History — 46 May St.

A.B., Ohio University, 1906; A.M., University of Chicago, 1910; Instructor in Latin and History, Vincennes University, 1911–13; Fellow in History, Clark University, 1914–.

JOHN THOMAS WARD, A.B., Springfield
Fellow in Chemistry — 65 Downing St.

A.B., Clark College, 1914; Assistant in Chemistry, 1914–15; Scholar in Chemistry, Clark University, 1914–15.

CURTIS T. WILLIAMS, A.M., Emporia, Kansas
Fellow in Psychology — 145 Woodland St.

A.B., Kansas State Normal School, 1913; Scholar in Psychology, Clark University, 1913–14; A.M., 1914; Instructor in English, State University of Arkansas, 1914–15.

SAMUEL ZELDIN
Fellow in Mathematics — 174 Chandler St.

Graduate, Real Gymnasia, Orsha, Russia, 1913; Scholar in Mathematics, Clark University, February 1914–15.

HONORARY SCHOLARS

CHARLES BERNARD LEWIS, M.D.
Honorary Scholar in Pedagogy — 52 May St.

M.D., Tufts Medical College, 1909; Physical Director, Allegheny College, 1902–05; Tufts College, 1905–09; Scholar in Pedagogy, Clark University, 1913–; A.M., 1915.

ANGELINA L. WEEKS, A.B., Pittsfield
Honorary Scholar in Pedagogy — 13 Gates St.

A.B., Mt. Holyoke College, 1894; Graduate Student, Massachusetts Institute of Technology, 1901–02; Professor of Biology and Chemistry, American College for Girls, Constantinople, Turkey, 1906–07; Honorary Scholar in Pedagogy, Clark University, 1914–.

SCHOLARS

HARRY ALBERT, A.B.
Scholar in Pedagogy — 46½ Providence St.

A.B., Clark College, 1915.

EDWIN EUGENE ALDRIN, A.B.
Scholar in Physics — 18 Tallawanda Drive

A.B., Clark College, 1915.

BERNARDIN SEDRICKS BROWN, B.S., Washington, D. C.
Scholar in Mathematics — 204 Chandler St.

B.S., Howard University, 1915.

FRED CHARLES CONLEY, B.PD., Newburg, West Virginia
Scholar in Pedagogy — 9 Woodbine St.

B.Pd., Bethany College, 1914; Scholar in Pedagogy, Clark University, February 1915–.

JAMES FRANCIS CONLIN, A.B.
Scholar in Pedagogy — 45 Harlem St.

A.B., Holy Cross College, 1915.

ROSWELL FREDERICK CURTIS, A.B., Framingham
Scholar in Chemistry — 20 Downing St.

A.B., Clark College, 1915; Assistant in Chemistry, 1915–.

CLARENCE HENRY ELLIOTT, A.B., Antrim, New Hampshire
Scholar in History — 18 Gardner St.

A.B., Clark College, 1915; Assistant in History, 1915–.

HAROLD ALLEN FERGUSON, A.B., East Lexington
Scholar in Sociology — 27 Clifton St.

A.B., Clark College, 1914; Assistant in Economics, 1915–.

CARL DAVID JOHNSON, A.B.
Scholar in Physics — 8 Loudon St.

A.B., Clark College, 1915; Assistant in Physics and Physical Training, 1915–.

James King, A.B.
Scholar in Psychology — 96 Locust Ave.
A.B., Oskaloosa College, 1912.

Shinichi Kurihara, B.D., Ibaraki, Japan
Scholar in Psychology — 91 Lovell St.
Graduate, Aoyama Gakuin, 1910; Student, Drew Theological Seminary, 1913–15; New York University, 1914–15; B.D., Drew Theological Seminary, 1915.

Joseph Twichell Lansing, A.B.
Scholar in History — 79 Institute Rd.
A.B., Clark College, 1915.

Howard Hale Long, B.S., Washington, D. C.
Scholar in Psychology — 204 Chandler St.
B.S. and B.Ed., Howard University, 1915.

Gustaf Albert Lundgren, A.B.
Scholar in Biology — 191 Vernon St.
A.B., Clark College, 1914; Assistant in Biology, 1914–; Scholar in Biology, Clark University, 1914–.

Ivan Eugene McDougle, A.B., Richmond, Kentucky
Scholar in History — 15 Shirley St.
A.B., Clark College, 1915; Assistant in History, 1915–.

Clyde B. Moore, A.B., Lincoln, Nebraska
Scholar in Pedagogy — 17 Wellington St.
A.B., Nebraska Wesleyan University, 1912; B. Ed., Nebraska State Normal School, 1913.

Curtis Hugh Morrow, A.B.
Scholar in History — 14 Chadwick St.
A.B., Clark College, 1910; Assistant in History, 1910–12; Scholar in History, Clark University, 1910–12; A.M., 1911.

Veazie Winthrope O'Hara, A.B., Wichita, Kansas
Scholar in History — 21 Pearl St.
A.B., Fairmount College, 1914.

Henry Cole Parker, B.S., Highland, California
Scholar in Chemistry — 982 Main St.
B.S., Kalamazoo College, 1915.

LEROY ELDEN PEABODY, B.S., Middletown, Connecticut
Scholar in Mathematics — 84 Woodland St.
B.S., Norwich University, 1915.

FRANCIS WILLIAM POWER, A.B.
Scholar in Chemistry — 18 Lowell St.
A.B., Holy Cross College, 1915.

CARROLL CORNELIUS PRATT, A.B.
Scholar in Psychology — 54 Downing St.
A.B., Clark College, 1915.

ELLERY FRANCIS REED, B.S., Fulton, Missouri
Scholar in Sociology — 3 Woodbine St.
B.S., Lenox College, 1914.

FRANCIS ALOYSIUS RYAN, PH.B., Canton
Scholar in Pedagogy — 974 Main St.
Graduate, State Normal School, Fitchburg, 1913; Ph.B., Boston College, 1915.

ANCEL ST. JOHN, PH.B.
Scholar in Physics — 53 Queen St.
Ph.B., University of Rochester, 1906; Instructor in Physics, Syrian Protestant College, Beirut, Syria, 1906–09; Assistant in Physics, Columbia University, 1909–10; Acting Professor of Physics, Emory and Henry College, 1910–12; Instructor in Physics, Worcester Polytechnic Institute, 1912–; Student in Physics, Clark University, 1912–13; Scholar in Physics, 1913–.

MAX SMALL, A.B.
Scholar in Chemistry — 51 Coral St.
A.B., Clark College, 1915.

LAWRENCE SMITH, A.B.
Scholar in History — 1404 Main St.
A.B., Clark College, 1915; Assistant in History, 1915–.

BENJAMIN L. WAITS, B.S., Florence, Alabama
Scholar in Mathematics — 204 Chandler St.
B.S. and B.Ed., Howard University, 1914.

WILLIAM EDWARD ZEUCH, A.B., Hopkinton, Iowa
Scholar in Sociology — 9 Woodbine St.
A.B., Lenox College, 1915.

John Edward Bentley
Student in Psychology — 89 May St.

Graduate, Coöperating Theological Colleges, Montreal, 1915.

Robert Irving Bramhall, A.M., Holden
Student in History

A.B., Clark College, 1905; Scholar in History, Clark University, 1905–07; A.M., 1906; Assistant in History, Clark College, 1905–February 1908; Scholar in History, Clark University, 1914–15.

Hazel McCrum Buckey, Ph.B., Rockville, Connecticut
Student in History — 8 May St.

Ph.B., Brown University, 1909.

Alice May Burgess, A.B., St. Louis, Missouri
Student in Pedagogy — 6 Lucian St.

A.B., Cornell University, 1914.

Cora Belle Drew, Burlington, Vermont
Student in History — 5 High St.

Student in History, Clark University, 1914–.

Robert Thomas Elliott, A.M.
Student in History — 33 Berwick St.

A.B., Amherst College, 1897; Scholar in History, Clark University, 1909–10; Student, 1910–12; A.M., 1911.

Nathan Howard Gist, D.D.S., Webster
Student in History

D.D.S., Northwestern University, 1908.

Evelyn Gough, A.B., Mount Vernon, New York
Student in Experimental Psychology

A.B., Wellesley College, 1914; Graduate Assistant in Psychology, 1914–.

Ethel Culbert Gras, A.B.
Student in Psychology — 12 Tirrell St.

A.B., University of Toronto, 1915.

Mildred Louise Grimes, A.B., Lawrence
Student in Experimental Psychology

A.B., Wellesley College, 1914; Graduate Assistant in Psychology, 1914–.

Thomas Hancock, B.D., West Chelmsford
Student in Psychology

S.T.L., Wesleyan College, Montreal, 1906; B.D., Hartford Theological Seminary 1914.

Gertrude Emma Kneeland, A.B.
Student in History — 15 Clifton St.

A.B., Brown University, 1915.

Frederica Feitshans Kraus, A.B.
Student in Biology — 11 Downing St.

A.B., Kansas University, 1902.

Gren Oren Pierrel, B.S.
Student in History — 53 Queen St.

B.S., Penn College, 1913; Student in History, Clark University, 1914–.

Mary D. Rebboli, A.M.
Student in History — 288 Pleasant St.

A.B., Wellesley College, 1903; A.M., 1908.

William Franklin Slade, A.M., Southboro
Student in History

A.B., Bates College, 1913; B.D., Bangor Theological Seminary, 1913; Graduate Assistant in Geology and Astronomy, Bates College, 1913–14; Scholar in History, Harvard University, 1914–15; A.M., 1915.

Marjorie Stewart, A.B.
Student in History — 6 Beechmont St.

A.B., Vassar College, 1912.

Alfred T. Ware, A.B.
Student in History — 50 Woodland St.

A.B., Penn College, 1892; Student in History, Clark University, 1914–.

Attendants upon Saturday Courses

Francis Calnan, Paxton
Lydia R. Hiller, Westboro
Charles H. Keyes, Millbury
James F. Leary, Worcester
Laura S. Plummer, Boston
J. Augustus Prendiville, Worcester
Frederick A. Sweet, Worcester
Albert H. Turner, Paxton

Attendants upon Childern's Institute Lectures

Lella M. Ayres
Blanche Convery
Mrs. M. F. Feitshans
Anna G. Fitman
Helen E. Greenwood
May Knox
Josephine V. Kane
Mrs. James B. Lowell
Mrs. William B. Mooney
Mrs. C. K. Pevear
Laura G. Smith
Emma C. White

Undergraduates Attending One or More University Courses

Abraham S. Levensohn
Lew Harlow Morse
Austin S. Whittey

Florence Chandler — 938 Main St.
Bursar, and Clerk of the University

Abby Johnson, A.B. — 28 Moore Ave.
Assistant in the Bursar's office

Mary Evelyn Fitzsimmons, S.B. — 48 Downing St.
Private Secretary to the President

Instructors	23
Fellows, Scholars and Students	104
Saturday Courses	8
Children's Institute Lectures	12
Undergraduates	3
Total	150

ADMINISTRATION

The trustees are the ultimate source of authority in all matters pertaining to the University. They act collectively, through committees, and also through the President of the University.

Duties of the President of the University

The duties of this office were defined by the Trustees, May 23, 1889, as follows:

The President of the University shall consult frequently with the Trustees on all matters that concern the welfare of the University, and attend the meetings of the Board. He shall confer with each instructor concerning the development of his department, determine the duties and authority of each, and preside at the meetings of the Faculty. He shall be the authorized medium of communication between the Board of Trustees and the officers of instruction, individually and collectively, in all matters involving the administration of the University. The enactments of the Board concerning instructors and their work, and all requests, complaints and proposals from the Faculty to the Trustees shall be made known through him. He shall exercise or provide such superintendence over buildings, apparatus, books and other property, as will secure their protection and appropriate use. Expenditures must not be ordered by any instructor of the University without his previous consent or the express authority of the Board.

These duties were more fully defined by By-Laws enacted by the Corporation, Sept. 26, 1889. These are as follows:

BY-LAWS

1. The President of the University shall preside on all public academic occasions, shall direct the official correspondence, study the wants and interests of the whole University and exercise a general superintendence over all its concerns. His first care, and that of the authorities of the University, shall be the departments already established, and next those closely related to them; but no other department shall be established until those already introduced have been brought to the highest state of efficiency then possible. All acts, however, which shall involve the expenditure of money in the administration of the University's affairs, shall be subject to the approval of the Board of Trustees or the Finance Committee for the time being.

2. As the efficiency of a University depends chiefly upon the quality of its Faculty, the Board of Trustees will hold the President to a strict but reasonable accountability for the fidelity and ability of each instructor. The President only shall have the power to select and appoint all officers of instruction, subject to the approval of the Board of Trustees. To make wise and well-considered appointments, to maintain harmony within the Faculty, and to increase their efficiency in research and instruction shall be his most important duty. If at any time the President shall be negligent in the discharge of these or other duties, or is from any cause disabled from discharging them, they may be exercised by the Board of Trustees.

3. The President of the University shall be the medium of communication between the Trustees and Instructors, individually and collectively, upon all matters within the field of

action of either body. He shall attend all meetings of the Board of Trustees, of which he shall be notified, and shall participate in their deliberations, but without the power to vote. All complaints and requests from members of one body to the other shall be made through him.

4. The President shall call and preside over all official meetings of the Instructors, and a record of their proceedings shall be kept. These records are in no case to be made known to others than the Trustees. They shall always be in the custody of the President, but may be inspected by the Trustees, or either of them, at any time.

5. The President of the University, in the absence of the Trustees or Finance Committee, shall have the entire direction and control of the persons employed about the University and not engaged in the work of instruction; the duties of all such persons shall be assigned and they shall be appointed or removed by him, subject to the approval of the Finance Committee.

6. No instructor shall order any books or apparatus, or anything connected with the work of instruction (beyond his appropriation), without the approval of the President. No expense for the care of buildings or grounds, nor for alterations or repairs within and upon the same shall be made without the approval of the Board of Trustees or the Finance Committee, such alterations or repairs in no case to exceed the appropriations made for that purpose. If the Trustees, or Finance Committee,or any person, shall make contracts in behalf of the University without authority, the officer or person making such contract shall become individually responsible therefor.

7. The officers of instruction shall be appointed for a term of from one to five years. At the end of this period the work of each instructor will be subjected to a careful scrutiny upon the results of which his reappointment shall depend, always provided, however, that any Instructor will be liable to be dis-

charged at any time for incapacity, neglect of duty or for such other cause as shall seem good to the Trustees.

8. Each Instructor shall give stated lectures to however few. He shall actively and zealously strive to maintain the highest possible standard, shall work in a spirit of hearty sympathy and coöperation, and shall encourage research by precept and, if possible, by example.

9. The foregoing By-Laws are intended to embody the provisions contained in a vote passed by the corporation on the twenty-third day of May, A.D. 1889, upon the motion of Judge Devens. (See above.) If at any time hereafter any discrepancy shall be found to exist between the two, said By-Laws shall be so far modified as to conform to the provisions of said vote.

10. No instructor shall engage in any outside professional or technical pursuit without the approval of the Board, the Finance Committee, or the President.

11. These By-Laws, or any one of them, may be changed, amended, or repealed by a vote of three-fourths at least of the Trustees at any meeting of their Board duly called, notified, and held for that purpose.

GENERAL STATEMENTS

The University now consists of eight departments, in which all its work and that of Instructors, Fellows and Scholars is grouped.

These departments are as follows:

I. Mathematics
II. Physics
III. Chemistry
IV. Biology
V. Psychology
VI. Pedagogy
VII. Economics and Sociology
VIII. History

The Faculty

The University Senate consists of the full professors in the University, whose duty it is to take action upon general requirements for the Doctor's degree and other promotions, and to act and advise upon matters officially submitted to them.

The General Faculty considers all matters not otherwise provided for and in which all departments of the University are alike interested. It consists of all the members of the teaching staff in the University who shall be requested to sit in it.

Admission

Only graduate students or those of equivalent attainments are admitted to full membership in the University, except in rare and special cases.

At present no entrance examinations are required; but by testimonials, diplomas, personal interviews, or written specimens of work, the authorities must be satisfied that the applicants have scholarship enough to work to advantage, and zeal and ability enough to devote themselves to their chosen field. The methods of the University are too costly, and its energy and funds too precious, to be spent upon those who are not well trained, promising and in earnest.

It is highly desirable that candidates entering any of the eight departments shall have, beside a knowledge of the other subjects commonly taught in colleges, a reading knowledge of French and German.

For the select students who are received, it is the purpose of the University to open all its privileges and to supply every incentive possible in the way of books, facilities, and, above all, direct personal stimulus. The chief as well as the best work of this University is individual and involves daily suggestion, encouragement and direction. The limited number of students permits more or less personal instruction in each case.

Classes of Appointees

No clearly marked line exists between students and instructors. Fellows who have attained some degree of mastery in a special line of work sometimes give brief special courses, which may be attended by professors.

This is a stimulus to the student, and both tests and exhibits power in teaching.

I. DOCENTS

The highest residential appointment not involving membership in the Faculty is that of Docent. These positions are designed for men of marked gifts and attainments who have at least attained the doctorate and wish to engage in research, teaching, or both.

Class A. Free Docents

Each docent of this class will be expected to deliver a limited number of lectures on some topic within his department. In so doing, he shall be entirely independent of other instructors both in his choice of special topic and his manner of treating it, and responsible only to the President of the University, by whom he shall be appointed after consultation with the head of the department. The free docent shall have command of the resources of the department in the way of books, apparatus, etc., so far as this does not interfere with its regular work. By establishing free docents, the Faculty desires not only to maintain and guarantee the fullest academic freedom, but to expose itself to all the stimulus that can come by the rivalry of younger or outside men, and to introduce new topics and new departures in old ones.

Class B. University Docents

A University docent shall engage in research and may collaborate with the head of the department or other

member of the Faculty and supplement his work. He shall be appointed by the head of the department with the approval of the President.

Habilitation of Docents

A docent of either class may prepare and read in public an habilitation address representing original work after a term of service of a length and under conditions to be determined by the Faculty for each individual case. Upon doing this, he may be formally presented with a certificate or diploma granting him the *venia docendi* or licentiate, which shall not be a title or degree, but shall attest his fitness as scholar or investigator for an academic position and shall be regarded by the University as a brevet collegiate professorship. The fee for such a certificate shall be $25, which the Faculty shall have power to remit. The compensation of a docent of either class, if any, shall be determined by the President, and the fees to be paid him by students, if any, shall be determined by the Bursar.

It is believed that the difficulties of college authorities in selecting suitable professors may be somewhat diminished by the existence of such a select body of scholars of guaranteed scientific training, ability, and approved power to teach, and that this new grade may aid in raising the standard of academic scholarship.

II. QUIZ MASTERS

Each member of the University Faculty may, with the approval of the President, appoint one or more quiz masters who with the aid of his lecture notes, or

otherwise, shall conduct review classes upon his lectures and who may hold preliminary tests, but who shall not lecture or give instruction save as review. These positions shall be regarded as honorary and as a privilege of more advanced students in perfecting their own knowledge and acquiring practice in instruction.

III. NON-RESIDENT LECTURERS

The representatives of each department may, with the approval of the President, bring eminent experts for exchange or other lectures of a special nature at any time during the academic year. They may also in return, with the approval of the President, give similar brief courses in other institutions, provided this does not interfere with their full efficiency for the work of this University.

IV. HONORARY FELLOWS

Those who have already advanced to the Doctor's degree may be appointed Honorary Fellows and given the privileges of the University, including those of the Library. In past years many who have already taken this degree, either in this country or abroad, and who are awaiting academic appointment, have found these positions both helpful for their own further research and development and also advantageous for obtaining the collegiate and university appointments that they seek.

V. CANDIDATES FOR THE DEGREE OF DOCTOR OF PHILOSOPHY

Candidates for the Doctor's degree must have previously taken the Degree of Bachelor of Arts or have had

a substantial equivalent for the training implied by that degree.

At least one year, but in most cases three years, of graduate work are necessary for this degree. Examinations for it, however, may be taken at any time during the academic year when, in the judgment of the University authorities, the candidate is prepared, provided the requirement of one year's residence has been absolved.

For this degree one requirement is a dissertation upon an approved subject, to which it must be an original contribution of value. To this capital importance is attached. It must be reported on in writing by the chief instructor before the examination, printed at the expense of the candidate, and at least one hundred copies given to the University. However, in case of a dissertation of unusual length, or containing expensive plates, the Faculty shall have power, at the request of the candidate, to reduce this number of presentation copies to fifty.

Such formal or informal tests as the Faculty may determine shall mark the acceptance of each student or Fellow as a candidate for this degree. One object of this preliminary test shall be to insure a good reading knowledge of French and German. Such formal candidature shall precede the examination itself by a period prescribed in the special rules below.

The fee for the Doctor's degree is $25, payable before the examination. The presentation copies of the dissertation must be in the hands of the Librarian before the diploma is delivered. In exceptional cases, and by special action of the Faculty, the act of promotion may precede the presentation of the printed copies of the dissertation.

An oral, but no written, examination is required upon at least one minor subject in addition to the major before an examining jury composed of at least four members, including the head of the department and the President of the University, who is authorized to invite any person from within or without the University to be present and to ask questions. The jury shall report the results of the examination to the Faculty, who will recommend satisfactory candidates for the degree.

For the bestowal of this degree, the approbation of the Board of Trustees must in each case be obtained by their signature upon the diploma. They desire that the standard of requirements for it be kept the highest practicable, that it be reserved for those of superior ability and attainment only, and that its value be never suffered to depreciate.

It is to the needs of candidates for this degree that the lectures, seminaries, laboratories, collections of books, apparatus, etc., are especially shaped, and no pains will be spared to afford them every needed stimulus and opportunity. It is for them that the Fellowships and Scholarships are primarily intended, although any of these honors may be awarded to others.

On November 14th, 1900, the following vote was passed by the Board of Trustees:

That the University will admit candidates for the degree of Doctor of Philosophy and will confer that degree without regard to sex.

Special Rules concerning the Doctor's Degree

I. *Residence.* No candidate shall receive the degree of Doctor of Philosophy without at least one academic year's previous residence.

II. *Candidature for the Doctor's Degree.* Every applicant for the Doctor's degree shall fill out, before October fifteenth, the regular application blank provided at the office. This schedule shall be submitted to the head of the department. Before affixing his signature he shall satisfy himself, in such manner as he may desire, as to the fitness of the applicant.

III. When countersigned, this schedule shall be filed with the President, and the applicant will be examined in French and German by the annual committee for that purpose.

IV. In case of a favorable report by this committee, the applicant shall be a regular candidate for the degree.

V. Candidates complying with all preliminary conditions, including the examinations in French and German, before November first will be allowed to proceed to the doctor's examination at any time between May fifteenth following and the end of the academic year.

VI. *The Doctor's Dissertation.* The dissertation must be presented to the instructor under whose direction it is written, and reported upon by him before the doctor's examination. In every case the dissertation shall be laid before the jury of examination, at the time of examination, in form suitable for publication. This provision shall not, however, preclude the making of such minor changes later as the chief instructor may approve.

VII. The dissertation shall be printed at the expense of the candidate and the required copies deposited with the Librarian within one calendar year after the first of October following the examination. The candidate alone will be held responsible for the fulfilment of these conditions.

VIII. The favorable report of the chief instructor, filed in writing with the Clerk of the University, shall be a sufficient imprimatur or authorization for printing as a dissertation. The printed copies shall bear upon the cover and title page the statement of approval in the following words, over the signature of the chief instructor:

> A Dissertation submitted to the Faculty of Clark University, Worcester, Mass., in partial fulfilment of the requirements for the degree of Doctor of Philosophy, and accepted on the recommendation of
>
> (Name of Chief Instructor)

IX. *Examinations for the Doctor's Degree.* The examinations for the doctor's degree may be held at any time during the academic year, provided that at least one academic year has elapsed since the completion of the preliminaries of candidature, except in the case of fulfilment of these conditions between the beginning of any academic year and November first of that year, to which case Rule V applies. The examinations shall be held at such hours and places as the President may appoint.

X. Examinations may also be held during the regular vacations of the University, but for these an additional fee of five dollars to each examiner and the reasonable travelling expenses of any examiners who are out of town, all payable in advance, will be required.

VI. CANDIDATES FOR THE DEGREE OF MASTER OF ARTS

This degree is conferred upon candidates who comply with the following requirements:

1. The candidate shall have previously taken the degree of Bachelor of Arts, or have had a substantial

equivalent for the training implied by that degree, to be determined by special vote of the Faculty; but such degree or training must involve a good preparation for the work proposed for the Master's degree, in order that it may be accepted.

2. The candidate must devote a full academic year to post-graduate work in this University after receiving the Bachelor's degree or the training accepted as its equivalent. This work shall be mainly in one department, but the candidate may do also such other work as shall be advised by the head of his principal department —whose approval of the whole course shall be necessary. In particular cases, the candidate may be allowed, by special vote of the Faculty, to divide his work between two years; but the aggregate must, in all cases, amount to a full year's work, at least.

3. The candidate must satisfy the representatives of his principal department that he has done his work faithfully and has mastered the subjects involved, by such written and oral examinations and other tests as the department may require. The head of the department shall make a written report to the Faculty of the grounds on which the candidate is recommended, specifying the amount and character of his work, and this report shall be filed in the office.

4. The candidate must present a thesis or written report on some topic included in his course or closely related to it, that shall receive the approval of the representatives of his principal department, be accepted by the Faculty, and filed in the office.

5. Every candidate recommended for the Master's degree shall pay a fee of ten dollars.

6. The Master's degree will be conferred at the annual commencement in June of any year on those candidates only who shall have made written application to be considered as such on or before January 15th preceding and shall have fulfilled all the conditions here specified at least one week before Commencement, at which time the academic year shall be regarded as ending for the purposes of section 2.

VII. SPECIAL STUDENTS NOT CANDIDATES FOR A DEGREE

Any one desiring to undertake a special and approved line of research, and whose attainments are such as to satisfy the requirements of the University, may also be received. This class includes persons who may desire to devote themselves exclusively to one or more of the special branches—mathematics, physics, chemistry, biology, psychology, pedagogy, economics and sociology, or history—but who do not care to matriculate or become candidates for a degree.

These students, provided they satisfy the heads of the departments of their training and competency in one subject, in which they must be advanced (although they may be less so, or even beginners, in other subjects), may be allowed entire freedom in their choice and combination of studies, and as special students may enjoy all the privileges of the University.

These students may, with the approval of the President, be received for less than an entire year.

VIII. PRELIMINARY CANDIDATES

Non-university students of less special or less advanced standing than the above classes, who contemplate becoming candidates for some higher degree, may also be received.

Students of this class must satisfy the authorities of the University of their attainments and that they contemplate advancing to a degree higher than that of A.B. The privileges and status of these students will be more fully defined later. They may, in exceptional cases, be elected to Scholarships.

Fellowships and Scholarships

From the George F. Hoar Fund of $100,000 provided by the generosity of Andrew Carnegie, the sum of $3,000 is now available for Junior and Senior Fellowships in the University. While the sums attached to these appointments are not fixed, a Senior Fellow may receive $200 together with the remission of fees; which makes the value of the appointment $300. A Junior Fellow may receive $100 with remission of fees, which makes the value of the appointment $200. Besides these, other appointments of Senior and Junior University Scholarships, with remission of fees, are made.

A CITIZEN'S FUND

A citizen of Worcester has given a fund of $5,000, the income of which is to be used for the aid of "some one or more worthy native born citizens of the city of Worcester who may desire to avail themselves of the advantages of the institution."

THE FIELD FUND

Mrs. Eliza W. Field has also given $500 to be called the "John White Field Fund," the income of which is "to provide for the minor needs of a Scholar or Fellow."

The following regulations apply to the award of the income of the Field Fund:

1. Regard is had to the intellectual ability of the candidate as well as to need of pecuniary assistance.

2. Only candidates who have spent three months at the University are considered.

3. The head of each department will consider and report to the Faculty desirable cases in his department.

4. Applications are received not later than December 15th, and the awards made as soon as possible after the Christmas recess.

THE ELIZA D. DODGE FUND

Mrs. Dodge has given $1,000 to be known as the "Eliza D. Dodge Fund," the income only to be expended in aid of graduate students of limited means engaged in research work.

PURPOSE AND CONDITIONS OF FELLOWSHIPS AND SCHOLARSHIPS

Fellowships at Clark University are intended for young men and women of promise who desire to pursue post-graduate studies in order to fit themselves for intellectual careers. It is desirable, but not required, that candidates for these positions should intend to proceed to the degree of Doctor of Philosophy or to equivalent attainments. In general, those intending to devote themselves to some

special branch of learning are preferred to those directly fitting themselves for one of the three learned professions, although the latter are not excluded.

No application blanks are provided, but it is desired that the candidate should state fully and in writing his previous course of study and submit testimonials or diplomas, especially such as indicate a decided preference for some particular department. These should be accompanied also, if practicable, by some specimen of the candidate's work. Applications will be considered in May and in October and should be in the hands of the President on or before the first day of either month. In special cases vacancies may be filled by appointments at any time during the year. The names of unsuccessful candidates will not be made public.

Fellows must reside in Worcester during the entire academic year, devote themselves to special studies under the direction of their instructors, and give such evidence of progress or proficiency before the end of the year as the authorities shall require. It is generally expected that they will undertake some work of research during the year. They must coöperate in promoting harmony, order, and all the ends of the University, must not teach elsewhere, and may be reappointed at the end of the year. Being intended primarily as honors, both Fellowships and Scholarships are awarded without reference to pecuniary needs, so that those Fellows able and desiring to do so may relinquish the emolument and retain the title.

Besides field work, excursions to institutions (public and private), coaching and cram classes, clubs, examinations, and other modes by which knowledge now seems best imparted and retained, the following educational methods are prominent:

Lectures. The Trustees desire that each instructor, of however few students, should prepare and deliver regular lecture courses, with diagrams, illustrative apparatus, and reference to standard text-books and the best current literature upon each topic. Advanced students are also encouraged to supplement the work of the professors by giving occasional special lectures and courses. Public lectures will be given from time to time.

Seminaries and Conferences. These are stated meetings for joint systematic work, under the personal direction of the professor, in some special part of his subject. Here students preparing theses and papers for publication in the journals edited at the University read them in incomplete form for mutual criticism and help. Here, also, the results of individual reading are reported for the benefit of all; views are freely criticised; new inquiries, methods, comparisons, standpoints, etc., suggested. From the mutual stimulus thus given many important works have proceeded and the efficiency of universities has been greatly increased.

Laboratory Work. For beginners this has been from the first the best of all forms of apprenticeship, bringing student and professor to a closer and mutually stimulating relation. Here the manipulation of apparatus is learned, processes are criticised, results obtained by other investigators are tested, and methods discussed

and perfected, with a view to developing that independence in research which is the consummation of scientific culture.

Notices

The charge for tuition, giving all the privileges of the University, but not covering the laboratory fees, is $100 per annum.

Board and lodging can be obtained near the University at very moderate rates.

Intending students will be given information, so far as possible, upon any of these or other points, in advance of official announcement, upon addressing the Clerk of the University, Miss Florence Chandler, Worcester, Mass.

All members of the University are expected to be present at the opening of each term and to continue in attendance to its close.

The following are the statements and announcements of the departments for the academic year, 1916–1917.

I. MATHEMATICS

Programme for 1916–1917

Instruction in Mathematics

The chief aim of the department is to make independent investigators of such students as have mathematical taste and ability; these naturally look forward to careers as teachers of the higher mathematics in colleges and universities, and we believe that the course of training best adapted to the development of investigators is also that which is most suitable for all who would be efficient college professors, even if they are not ambitious to engage in research. The first essential of success in either of these lines is the habit of mathematical thought, and the direct object of our instruction is the acquisition of this habit by each of our students. With this end in view, we expect every student to make himself familiar with the general methods and most salient results of a large number of different branches of mathematics, conversant with the detailed results and the literature of a few branches, and thorough master of at least one special topic to the extent of making a real contribution to our knowledge of that subject.

In accordance with these principles, the instruction is given by means of introductory, advanced and special courses of lectures, seminaries, and personal guidance in reading and investigation.

The introductory courses (mostly given in alternate years) treat the following subjects:

Analytic Geometry of Conics, Higher Plane Curves, Quadrics, Higher Surfaces, and Twisted Curves; 5 hours a week, through the year.

Differential Equations, and Calculus of Variations; 5 hours a week, through the year.

Theory of Functions of Real and Imaginary Variables, Elliptic Functions, and Definite Integrals; 5 hours a week, through the year.

Theory of Numbers; 2 hours a week, one half-year.

Higher Algebra; 5 hours a week, through the year.

Algebraic Substitutions and their Application to the Theory of Equations; 2 hours a week, one half-year.

Algebraic Invariants; 2 hours a week, one half-year.

Finite Differences; 2 hours a week, one half-year.

It is expected that every student will take each course in the earliest year of his residence in which it is given, unless he has already completed an equivalent course elsewhere. The chief object of these courses is to make the student familiar with the various methods of mathematical research and the concepts of mathematical thought at the present day. Thus, for example, curves and surfaces are treated by modern methods from the beginning, with adequate consideration of the discoveries of the great geometers of recent times. The usual college courses in the theory of algebraic equations, analytic geometry, and the differential and integral calculus furnish all the necessary preparation for these introductory courses, although it is very desirable that the student be acquainted with the properties of determinants and their application to the solution of linear equations, and with the methods of solving differential equations of the simpler types. Deficiencies in these subjects may be made up by attendance on the corresponding courses in the Collegiate Department of the University.

Special advanced courses, open to all who are prepared for them, are given annually in subjects varying with the interests of the instructors and the needs of the students. These advanced courses are not repeated at regular intervals, but properly prepared students will receive the personal assistance of one or other of the instructors in reading any

subject not announced for the year in which they desire to take it.

The number and scope of the advanced courses given each year have been, thus far, regulated by the number of students qualified to profit by them and by the individual interests of the instructors; these courses will be increased, both in number and variety, whenever a real demand for such an increase shall make itself apparent. While the present purely scientific character of the University precludes instruction in strictly technical branches, we hope that the time is not far distant when the demand shall make it advisable, and increased facilities shall make it possible, to announce courses in Descriptive Geometry, Graphical Statics, Mathematical Astronomy, Vital Probabilities, and all the more important applications of mathematics to other sciences and to technical subjects. The applications of mathematics to physics already receive adequate consideration, and the further extension of such applications awaits only a demand for it on the part of students.

The subjects in which advanced courses may be expected to be given every few years include the following:

History of Mathematics.

Arithmetic: Numerical computations; Theory of numbers; Finite differences and the Calculus of operations; Probabilities and the Theory of errors; Continued Fractions and their Applications.

Algebra: Substitution-groups and the Galois theory of equations; Invariants; Quadratic forms; Simultaneous equations (including Restricted systems); Multiple algebra.

Higher Analysis: Differential equations, ordinary and partial; Continuous groups; Definite integrals and Fourier's series.

Theory of Functions: Functions of real and complex variables; Point-aggregates; Elliptic functions; Abelian integrals.

Geometry: Modern synthetic geometry; Analytic geometry of higher plane curves, higher surfaces, and twisted curves; Rational and uniform transformations of curves and surfaces; Infinitesimal geometry; Analysis situs; Quaternions; Hyperspace and non-euclidean geometry.

Symbolic Logic.

Other courses will be given whenever there is a demand for them, as in the past. The instructors are always glad to assist students in any line of mathematics that falls within the range of their own studies. The small number of students makes it possible to give personal attention to individuals, and the intimate and confidential relation thus established between pupil and teacher is an advantage that cannot be overestimated and ought not to be left out of account by the prospective student in determining where his studies shall be pursued.

For the academic year 1916–17, the following courses of lectures are announced:

BY PROFESSOR STORY

Introductory Course:

Analytical Geometry of Higher Plane Curves, Higher Surfaces, and Twisted Curves; 3 hours a week, through the year.

Advanced Courses:

Calculus of Operations and Finite Differences; 3 hours a week, through the year.

Theory of Errors; 3 hours a week, first half-year.

History of Mathematics; 3 hours a week, second half-year.

Seminary for Advanced Students; through the year.

BY PROFESSOR TABER

Introductory Course:

Theory of Functions of Real and Imaginary Variables, Elliptic Functions and Definite Integrals; 5 hours a week, throughout the year.

Advanced Courses:

Transformation Groups; 2 hours a week, first half-year.

Picard-Vessiot Theory of Linear Differential Equations, or Integral Equations; 2 hours a week, second half-year.

Seminary; through the year.

BY PROFESSOR WEBSTER

[See announcement of Department of Physics, courses 10, 11, 13, 14.]

BY M. DE PEROTT

Introductory Course:

THEORY OF NUMBERS; 2 hours a week, first half-year.

Advanced Course:

ABELIAN INTEGRALS; 2 hours a week, second half-year.

BY DR. WILLIAMS

Introductory Course:

CONIC SECTIONS AND QUADRIC SURFACES; 2 hours a week, through the year.

While desirous of supplying all possible facilities to those who wish to pursue studies in special branches, and to those who, already occupying permanent positions, have but a limited leave of absence, we have made it our chief object to provide a thorough training for those who, having just completed a college course, have not yet entered upon their life-work. This provision consists of such courses of lectures, seminaries, and individual assistance as should enable a faithful student endowed with the proper natural ability to satisfy the requirements for the degree of Doctor of Philosophy at the end of his third year with us. The requirements for this degree have been determined by our conception of the ideal teacher, as already stated. To acquire the necessary breadth of knowledge of mathematics as a whole, the candidate is expected to attend, during his first two years, specified introductory courses of lectures on the general principles, methods, and results of all the more important branches of pure mathematics, to supplement these lectures by private reading and to take an active part in the seminary. In the seminary, a special topic more or less directly connected with the subject of some lecture, is assigned, from time to time, to each student, who is required to read it up and make an oral report upon it before the class. Each candidate for the Doctor's

degree is expected to attend a number of advanced courses. He spends the greater part of his third year in the original investigation, under the constant personal guidance of one of the instructors, of a topic of his own selection. In preparing for this investigation he is required to make a practically complete bibliography of the subject and to read all the more important available articles that have been written on it. The results of the investigation, embodied in a dissertation suitable for printing, must be submitted to the instructor under whose direction the work was done, and must receive his approval before the candidate will be admitted to the final examination for the degree. This approval will not be given unless the dissertation is satisfactory in form and completeness and the results are sufficiently novel and important to constitute a real contribution to science. The dissertation is, in fact, the main criterion by which the candidate is judged, and no amount of other work will compensate for its defects.

Each of the instructors is engaged in research and has always a number of investigations planned for himself, which have often been carried to a well advanced stage but are not completed for want of time. Such incomplete investigations are given to properly prepared candidates for the Doctor's degree, and they receive from the instructor all the assistance necessary for the completion of the work, thus becoming, to a certain extent, collaborateurs with the instructor.

The preparation of a bibliography of any topic is greatly facilitated by a classified index of mathematical literature on the card-catalogue plan, which has been prepared under the supervision of Professor Story and now includes over one hundred thousand titles of periodical articles, separate memoirs, and books in all fields of pure mathematics. This index is much more complete than the Royal Society's

catalogue, even in the restricted field of that catalogue (periodicals published between 1800 and 1900), and will be extended as rapidly as possible.

The ability of our graduates to carry on research and the excellence of the work actually done is assured by the regulation that each dissertation accepted by us as worthy of the degree shall be printed with the explicit approval of a member of our Faculty. It is evident that, whereas any one that has the necessary preparation and taste for mathematics may profit by the advantages here afforded, only those who have a certain amount of mathematical genius can secure the degree.

In making appointments to fellowships and scholarships we have endeavored to maintain the same high standard. We are on the lookout for mathematical geniuses; but it is difficult to determine from the evidence of others whether candidates come up to our standard or not; so that we have adopted the general policy of giving the best appointments to those only that have been with us for at least one year, and about whom we are in position to judge for ourselves. Of course, this policy could not be carried out during the earlier years of the University, and its effect is apparent in the fact that, whereas seventy-five per cent of the students that entered the mathematical department during the first three years remained with us but one year, only thirty-three per cent of those that have been admitted from 1892 to the present time left at the end of their first year. We do not mean to imply that those who left before completing our course were inferior in ability to those who remained three years, but we desire particularly to encourage men who can and will go forward to the degree.

Nearly all of those who have studied mathematics with us have adopted teaching as a profession, sixty-eight per cent are now members of college faculties, and thirteen per

cent are engaged in higher school work. Those who have received the doctor's degree have generally secured at once desirable positions in which to begin their life-work, and most of them have already acquired for themselves, by distinguished ability, very decided influence in the institutions with which they are connected.

The degree of Master of Arts will be conferred upon students who complete with credit an approved course of one year and present a satisfactory thesis.

Every facility for the study of special branches will be given to properly prepared students who are not candidates for a degree, as also to those who, having already attained to the Doctor's degree (here or elsewhere), wish to continue mathematical study or investigation.

Material Facilities

The library is provided with the more important text-books, treatises, and memoirs on the various branches of mathematics, as well as the principal journals and transactions of learned societies that are devoted to any considerable extent to mathematics. A list of these journals will be found below.

The mathematical department possesses a good collection of models, a Thomas arithmometer, and an Amsler planimeter with revolving table.

List of Journals Relating to the Exact Sciences in the University Library

Amsterdam.

Koninklijke akademie van wetenschappen. Verhandelingen, 1854 to date. Complete.

Revue semestrielle des publications mathématiques. 1893 to date. Complete.

Baltimore.

American chemical journal. 1879 to date. Complete.

American journal of mathematics. 1878 to date. Complete.

BANGKOK.

Siam society. Journal. 1905-07.

BERLIN.

Berliner mathematische Gesellschaft. Sitzungsberichte. 1902 to date. Complete.

Chemisches Centralblatt. 1897 to date. Complete.

Deutsche chemische Gesellschaft. Berichte. 1868 to date. Complete.

Fortschritte der Physik. 1847 to date. Complete.

Jahrbuch über die Fortschritte der Mathematik. 1868 to date. Complete.

Journal für die reine und angewandte Mathematik. 1826 to date. Complete.

Königlich-preussische Akademie der Wissenschaften. Mathematische und naturwissenschaftliche Mittheilungen aus den Sitzungsberichten. 1882-97. Complete.

Zeitschrift für angewandte Chemie. 1888 to date. Complete.

BOLOGNA.

Istituto di. Bologna. Reale academia delle scienze.

Commentarii. 1731-1791. Complete.

Novi commentarii. 1834-1849.

Memorie fis. e mat. 1806-1910.

Memorie. 1850 to date. Complete.

Scientia; rivista di scienza. 1910 to date. Complete.

BOSTON.

American academy of arts and sciences. Proceedings. 1870 to date. Complete.

North American Review. 1815–1886.

Technology review. 1899 to date. Complete.

BOULDER, COLORADO.

University of Colorado. Studies. 1902 to date. Complete.

BRAUNSCHWEIG.

Deutsche physikalische Gesellschaft. Berichte. 1903 to date. Complete.

Jahresbericht über die Fortschritte der Chemie. 1847 to date. Complete.

BRESLAU.

Kaiserlich-Leopoldinisch-carolinische deutsche Akademie der Naturforscher. 1843.

BRUXELLES.

Académie royale des sciences des lettres et des beaux-arts de Belgique.

Bulletins. Ser. 3. 1889 to date.

Mémoires couronnés et mémories des savants étrangers. 1889-90.

CAMBRIDGE, ENGLAND.

Cambridge philosophical society.

Proceedings. 1843 to date. Complete.

Transactions. 1822 to date. Complete.

CAMBRIDGE, MASSACHUSETTS.

Science. 1883 to date. Complete.

CHARLOTTESVILLE, VIRGINIA.

Annals of mathematics. 1884 to date. Complete.

CHICAGO.

Astrophysical journal. 1895 to date. Complete.

School science and mathematics. 1901 to date. Complete except vol. 13, Nos 1-2.

Terrestrial magnetism. 1896 to date. Complete.

COLUMBIA, MISSOURI.

University of Missouri studies. Science series. vol. 1. 1905-07.

DRESDEN.

Zeitschrift für Chemie und Industrie der Kolloide. 1906 to date. Complete.

EASTON, PENNSYLVANIA.

American chemical society.

Chemical abstracts. 1907 to date. Complete.

Journal. 1879 to date. Complete.

Proceedings. 1878 to date. Complete.

Journal of industrial and engineering chemistry. 1909 to date. Complete.

EDINBURGH.

Edinburgh mathematical society. Proceedings. 1884-1907.

Edinburgh philosophical journal. 1819-1826.

Edinburgh royal society transactions. 1873 to date. Complete.

GÖTTINGEN.

Königliche Gesellschaft der Wissenschaften. Nachrichten von der k. Gesellschaft der Wissenschaften und der Georg-Augusts-universität. 1853 to date.

GREIFSWALD.

Archiv der Mathematik und Physik. 1901 to date.

HAARLEM.

Hollandsche maatschappij der wetenschappen. Archives néerlandaises des science exactes et naturelles. 1866 to date. Complete.

HALIFAX.

Nova Scotian institute of science.

Proceedings and transactions. Halifax. 1890 to date. Complete.

HALLE.

Zeitschrift für Electrochemie. 1895 to date. Complete.

HAMBURG.

Mathematische Gesellschaft. Mittheilungen. 1890 to date. Complete.

Zeitschrift für anorganische Chemie. 1892 to date. Complete.

HEIDELBERG.

Annalen der Chemie. 1832 to date. Complete.

INDIANAPOLIS.

Indiana academy of science. Proceedings. 1895-98.

ITHACA.

Journal of physical chemistry. 1896 to date. Complete.

LAWRENCE, KANSAS.

Kansas University science bulletin. 1902-1908.

LEIPZIG.

Acta Eruditorum, 1682-1731. 50 vols. Supplementa, 1692-1734. 10 vols. Indices generales, 1693-1733. 10 vols. in 5.

Nova Acta Eruditorum, 1732-1782. 13 vols. Supplementa, 1735-1739. 3 vols. in 2.

Annalen der Physik. 1824 to date. Beiblätter, 1889 to date. Complete.

Archiv für Optik. vol. 1. 1908.

Chemische Novitäten. 1905-08.

Deutsche Mathematiker-vereinigung. Jahresbericht. 1890 to date. Complete.

Encyklopädie der mathematischen Wissenschaften mit Einschluss ihrer Anwendungen.

Fortschritte der Chemie, Physik und physikalischen Chemie. 1909.

Internationale Mathematiker-congresse. Verhandlungen. 1897 to date. Complete.

Jahrbuch der drahtlosen Telegraphie und Telephonie. 1908 to date. Complete.

Jahresbericht über die Leistungen der chemischen Technologie. 1856 to date. Complete.

LEIPZIG (Continued).

Journal für praktische Chemie. 1834 to date. Complete.
Königlich-sächsische Gesellschaft der Wissenschaften.
Berichte über die Verhandlungen der mathematisch-physischen Classe. 1849 to date. Complete.
Abhandlungen der mathematisch-physischen Classe. 1852 to date. Complete.
Mathematische Annalen. 1869 to date. Complete.
Zeitschrift für Chemie. 1866-71.
Zeitschrift für Mathematik und Physik. 1856 to date. Complete.
Zeitschrift für physikalische Chemie. 1887 to date. Complete.
Zeitschrift für mathematische und naturwissenschaftliche Unterricht. 1903 to date.
Zeitschrift für wissenschaftliche Photographie, Photophysik und Photochemie. 1903 to date. Complete.

LIÈGE.

Société royale des sciences. Mémoires. 1843 to date. Complete.

LONDON.

British academy. Proceedings. 1905. 1907.
British association for the advancement of science. Reports. 1831 to date. Complete.
Chemical news and journal of physical science. 1904 to date. Complete.
Chemical society of London.
Annual reports on the progress of chemistry. 1905 to date. Complete.
Journal. 1849 to date. Complete.
Electrician. 1891 to date. Complete.
International catalogue of scientific literature. 1902 to date. Complete.
London mathematical society. Proceedings. 1865 to date. Complete.
Royal Society.
Proceedings. 1800 to date. Complete.
Philosophical transactions. 1665 to date. Complete.
Mathematical gazette. 1896 to date. Complete.
Nature. 1870 to date. Complete.
Nineteenth century. 1877 to date. Complete.
Philosophical magazine. 1798 to date. Complete.
Physical Society of London. 1876 to date. Complete.
Quarterly journal of pure and applied mathematics. 1857 to date. Complete.
Quarterly review. 1809-1885.
Science abstracts. 1898 to date. Complete.
Science progress in the 20th century. 1907 to date. Complete.

MADISON.

Wisconsin academy of arts and sciences. Transactions. 1898.

MANILA.

Philippine journal of science. 1906 to date. Complete.

MILANO.

Annali di matematica, pura ed applicata. 1889 to date.
Reale istituto lombardo di scienze e lettere. Classe di scienze mathematicech naturali.
Rendiconti. 1864-67. Complete.
Rendiconti. 1868 to date. Complete.
Memorie. 1843 to date. Complete.

MONTREAL.

Royal society of Canada. Proceedings and transactions. 1882-1906.

MÜNCHEN.

Königlich bayerische Akademie der wissenschaften. Sitzungsberichte der mathematisch physikalischen Klasse. 1871 to date. Complete.

NEW HAVEN.

American journal of science and arts. 1871 to date. Complete.

NEW YORK.

American mathematical society.

Annual register. 1892 to date. Complete.

Bulletin. 1894 to date. Complete.

Transactions. 1900 to date. Complete.

American society of biological chemists. Proceedings. 1907 to date. Complete.

Appleton's journal of literature, science and art. 1869-76.

Electrical world and engineer. 1907 to date. Complete.

Journal of biological chemistry. 1905 to date. Complete.

The Minerva. 1824-26.

New York Mathematical Society. Bulletin. 1891-94. Complete.

Popular science monthly. 1872 to date. Complete.

Physical review. 1894 to date. Complete.

OXFORD.

Messenger of mathematics. 1862 to date. Complete.

PALERMO.

Circolo matematico di Palermo. Rendiconti. 1887 to date. Complete.

PARIS.

Annales de Chemie et de physique. 1789-1908.

Annales scientifiques de l'École normale supérieure. 1864 to date. Complete.

Association française pour l'advancement des Sciences. Comptes rendus des sessions. 1873 to date. Complete.

Bulletin des sciences mathématiques. 1870 to date. Complete.

Bureau international des poids et mesures. 1881 to date. Complete.

École polytechnique. Journal. 1794 to date. Complete.

Institut de France. Académie des sciences. Comptes rendus hebdomadaires des séances. 1835 to date. Complete.

Journal de mathématiques pures et appliquées. 1836 to date. Complete.

L'éclairage électrique. 1894-1907.

L'enseigmement mathématique. 1899 to date. Complete.

Nouvelles annales de mathématiques. 1842 to date. Complete.

Revue des deux mondes. 1908 to date. Complete.

Revue générale des sciences pures et appliquées. 1903 to date. Complete.

Revue scientifique. 1863 to date. Complete.

Société chimique de Paris. Bulletin. 1858 to date. Complete.

Société mathématique de France. Bulletin. 1873 to date. Complete.

ST. PETERSBURG.

Journal of physical chemistry. (Russian Text.) Chemical section and physical section. 1909 to date.

PHILADELPHIA.

Academy of natural sciences of Philadelphia. Proceedings. 1890 to date. Complete.

American electrochemical society. Transactions. 1902 to date. Complete.

Lippincott's magazine of literature, science and education. 1868-1881.

PISA.

Il Nuovo Cimento. 1891 to date. Complete.

ROME.

Reale accademia dei lincei. Atti. Rendiconti. etc. 1847 to date.

SACRAMENTO.

Lick observatory. Publications. 1887-1903.

SALEM, MASSACHUSETTS.

American Association for the advancement of science. Proceedings. 1848 to date. Complete.

SIDNEY.

Australasian association for the advancement of science. 1888 to date. Complete.

STOCKHOLM.

Acta mathematica. 1882 to date. Complete.

Arkiv för matematik, Astronomi och fysik. 1903 to date. Complete.

Bibliotheca mathematica. 1884 to date. Complete.

STRASSBURG.

Zeitschrift für physiologische Chemie. 1877 to date. Complete.

STUTTGART.

Jarhbuch der organischen Chemie. 1908 to date. Complete.

Sammlung Chemischer und chemisch-technischer Vorträge. 1896 to date. Complete.

TOKYO.

Journal of the College of Science of the Imperial University of Japan.

Mathematico-physical society. Proceedings (Tôkyô sûgakubuturigakkwai kizi). 2nd Ser. 1901 to date. Complete.

TOULOUSE.

Université de Toulouse. Faculté des sciences. Annales. 1887 to date. Complete.

URBANA, ILLINOIS.

University of Illinois. University studies. 1900-1908.

WASHINGTON, D. C.

National academy of sciences.

Biographical memoirs. 1877 to date. Complete.

Memoirs. 1883-1902.

Reports. 1883 to date. Complete.

U. S. Bureau of Standards. Bulletin. 1905 to date. Complete.

U. S. Naval observatory. Publications 1900-1903.

U. S. Naval observatory. Astronomical and meteorological observations. 1885-1889.

WIESBADEN.

Zeitschrift für analytische Chemie. 1862 to date. Complete.

WIEN.

Kaiserliche Akademie der Wissenschaften.

Denkschirften; mathematisch-naturwissenschaftliche Classe. 1850-1908.

Sitzungsberichte der mathematisch-naturwissenschaftlichen Classe. 1848 to date. Complete.

Monatshefte für Mathematik u. Physik. 1908.

Monatshefte für Chemie und verwandte Theile anderer Wissenschaften. 1881 to date. Complete.

WORCESTER.

The Mathematical review 1896–97.

II. PHYSICS

The Department of Physics of Clark University is exclusively a department for graduate study and research in pure and applied physics. In order to set forth to the intending student the facilities of this department, stress may be laid on a number of points in which it is believed that the conditions here are exceptional.

First, the fact that the attention of the professor is not distracted from the needs of the student by other duties, which, combined with the small number of students in the department, enables an amount of personal attention to be given to each one which is perhaps unique in this country. The head of the department is able to see each student and to give him personal advice in the conduct of his researches or his studies every day if necessary. The facilities without which no graduate department of research in physics can be complete are comprised under three heads: first, a systematic course of lectures in theoretical or mathematical physics; second, a laboratory with a sufficient number of rooms for individual work and with a sufficient equipment of apparatus and an instrument shop for the speedy production of whatever may be necessary for the research in hand; third, a library containing the classic works on physics, with full sets of journals and proceedings of learned societies by which the history of progress, past and present, may be studied, and kept up-to-date by the continual purchase of the latest works. In all these directions the facilities offered by this department invite attention.

The lecture courses are so arranged as to cover in a cycle

of two years all the principal subjects and methods of theoretical physics. The pursuit of them will fit the student to read and study with facility any memoirs on mathematical physics. The courses are so arranged that, although they follow in order, it is possible for a student to begin in either year of the cycle. The regular courses are those not marked with a star, and constitute a course of from five to seven hours weekly. The starred courses are delivered at irregular intervals, according to the demands or the presence of students of sufficient advancement.

LECTURES

1. Dynamics. General Principles, Equations of Lagrange and Hamilton, Methods of Hamilton and Jacobi, Systems of Particles, Rigid Bodies.

This course is fundamental for the pursuit of all the others, and includes a detailed account of the principle of Least Action and the differential equations of Lagrange, preparatory to their application to other parts of mathematical physics such as optics and electricity.

2. Newtonian and Logarithmic Potential Functions, Attraction of Ellipsoids.

This course is a necessary preliminary to the study of electricity and magnetism, of hydrodynamics, and of the figure of the earth.

3. Elasticity, Hydrodynamics, Wave and Vortex Motion, Dynamical Basis of Sound and Light.

This course is the basis of applications of the theory of wave motion to sound, light, electro-magnetism, and earthquake waves, and to the study of meteorology.

3a. * Dynamics of Cyclic and Oscillatory Systems, with Applications to the Theory of Electricity, Sound and Light.

The substance of the preceding courses is contained in Professor Webster's Treatise on Dynamics, B. G. Teubner, Leipzig.

3b. * The Theory of Resonance with Applications to the Measurement of Sound and to Wireless Telegraphy.

This course takes up Professor Webster's original researches in acoustics, and also shows how the methods there employed bear on the fundamental electrical phenomena involved in wireless telegraphy.

4. Electricity and Magnetism. The Classical Theories and the Theory of Maxwell, with an account of the principal methods for the solution of problems and applications to absolute measurements.

The substance of this course is found in Professor Webster's Mathematical Treatise on the Theory of Electricity and Magnetism, London, Macmillan & Co.

4a. * Recent Developments in Electrical Theory, including the Theory of Lorentz and the Principle of Relativity.

The application to the theory of electrons and to the optics of bodies in motion.

5. The Theory of Light. Propagation of Light, Diffraction, Reflection and Refraction, Dispersion, Double Refraction, Polarization, Metallic Reflection, Magneto-optics, X-rays and Crystals.

5a. * Comparison of Theories of the Ether.

Critical and historical examination of the various mechanical explanations of the luminiferous ether, including those of Green, McCullagh, Kelvin, Maxwell, Sommerfeld and Larmor.

5b. * Geometrical Optics. Properties of Systems of Rays, and their Various Aberrations. Hamilton's Characteristic Function or Eikonal. Applications to Optical Instruments.

6. Thermodynamics. Thermo- and Electro-Chemistry.

The establishment of the two laws of thermodynamics, and their application, by means of the methods of Gibbs and Helmholtz, to the examination of physical and chemical phenomena. Application to heat-engines, including steam, gas, and oil engines, the flow of gases and vapors, and the steam turbine. The conditions of chemical equilibrium, phenomena of electrolysis, osmotic pressure, and capillarity.

7. The Kinetic Theory of Gases. The Maxwell-Boltzmann Theorem and the Elements of Statistical Mechanics.

8. * The Theory of Radiation and of a Black Body.

The relations obtained from the laws of Kirchhoff, Stefan, Wien, and Planck, by the recent applications of thermodynamics.

9. * The Phenomena of Conduction of Electricity in Gases, and of Radioactivity, and their Bearing on the Structure of the Atom.

10. The Partial Differential Equations of Mathematical Physics.

Laplace's Equation, Equation of Thermal and Electrical Conduction, Equation of Wave-motion, Helmholtz's Equation, Lorenz-Beltrami

Equation, Telegrapher's Equation, and their special cases; methods of Cauchy, Green and Riemann-Volterra; Normal functions, Developments in Series, Fourier's Series, Legendre's, Laplace's, Bessel's and Lamé's functions.

This course is one of the most important for the physicist, and treats a great variety of subjects from the most varied fields, grouping them all into a connected system, and embracing all the methods of theoretical physics.

11.* The Elements of Integral and Integro-Differential Equations, and their application to Mathematical Physics.

12.* Selected Chapters in the Application of Theoretical Physics to Cosmical Phenomena, including Problems in Geodesy, the Tides, Meteorology, Seismology, and Terrestrial Magnetism.

13.* Linear Differential Equations.

The applications of the theory of functions to the linear differential equations of the second order which arise in mathematical physics.

14.* Orthogonal Surfaces and Curvilinear Coördinates and their Applications.

The courses for 1916-17 will be 1, 2, 3, 4, 4a.

In addition to the above formal courses there is held a weekly Colloquium, or meeting for the informal discussion of subjects not treated in the lectures, and for the presentation by the students of reports on important articles appearing in the journals. A part of the work of the colloquium consists in the systematic presentation of certain classical researches, more or less connected with the lectures, in preparing which the students make use of the original sources of information, thus gaining much acquaintance with the methods of the masters in research. The work of the colloquium has an excellent effect in training students to present their ideas in a systematic manner before an auditory.

Among the various lines of investigation now attracting the attention of physicists the following are preëminent in importance. First, the interrelations between the luminiferous ether and ordinary matter, and the modifications necessary to be made in Maxwell's theory in order to explain the known optical and electrical phenomena of bodies in motion, and that aspect of the theory which deals with the properties of the small electric bodies known as electrons. This portion of mathematical physics is extremely new, and has hardly

begun to appear in university courses in this country. Second, the structure of the atoms of matter, to which the subjects of spectroscopy and the new and fascinating field of radio-activity give the most promising clew. Third, the thermodynamics of radiation in general, which is most intimately connected with the first, and about which a similar remark may be made as to the lack of instruction.

Of branches of applied physics now awaiting the attention of the mathematical physicist may be mentioned meteorology, seismology, and geophysics in general, in all of which the accumulation of experimental data is ahead of the development of theory, to such an extent in meteorology that Professor Arthur Schuster has said that it would be advisable to suspend all meteorological observations for the next ten years, until the theory should have in some degree caught up with the mass of information already accumulated. The theory of meteorology depends on complicated applications of hydrodynamics and thermodynamics; so as to make great demands upon the mathematical physicist, but the field is a rich one to him possessed of the skill to cultivate it. The study of earthquake phenomena is one that is now becoming of great importance in this country, while the investigation of terrestrial magnetism has lately made great advances.

It is almost obvious to the trained investigator that no one can expect to become a physicist of the first rank without a thorough training in mathematical physics, as without that the results of experiment will never be collected into a coherent system worthy the name of an exact science. Furthermore all mathematical physics must rest upon mechanics, the principles of which are of an importance transcending that of any other branch of natural science. It is for this reason that the courses in physics in this department begin with mechanics, and are developed progressively in a systematic manner. They have the advantage of having been deliberately planned

for the needs of students of pure physics, as experience has shown them to be prepared by the various colleges, and of being all delivered by the same person, so that logical consistency and continuity of method are assured. The waste of time often incurred by repetitions of the same subject and of changes of notation by various instructors is thus totally avoided. Attention is called to the fact that no branch of physics is left unprovided for in the course of lectures.

The aim of the department is to insure in its students some acquaintance with all the various fields of experimental physics, to develop in them the power of exact measurement, to accustom them to exact reasoning from experiment to theory, and to encourage original research conducted on a sound basis. To this end students will be put to work in the laboratory upon experiments of sufficient difficulty to give them skill in measurements of precision, and to enable them to become familiar with the precautions and corrections necessary to be employed in exact work. After a sufficient amount of experience has been gained, and the student has shown himself to be possessed of sufficient originality to warrant independent investigation, he will be encouraged to take up for himself an original research in the hope of making a personal contribution to science. In this research he will have at all times the benefit of the direction and advice of the professor.

It should be urged upon intending students to prepare themselves, not only in ordinary laboratory measurements, but also in mathematics, the lack of proper mathematical preparation being a serious drawback to the appreciation of the lectures. In particular may be recommended for study not merely those portions of the calculus which deal with the working out of many indefinite integrals, etc., but the theoretical portions which deal with the ideas of partial derivatives, definite integrals, and their practical manipulation, together with enough analytic geometry to involve the prop-

erties of lines and *surfaces* of the second order, and a fair amount of the elements of determinants. As suitable text-books for preparation may be recommended to the student Lamb's, Osgood's or Gibson's Calculus, C. Smith's Analytical Geometries, and Muir's or Hanus's Determinants. Appell, *Elêments de l'analyse mathématique* may be very strongly recommended to the intending student for study before and during his course at the University.

It cannot be too strongly urged that the student should, from the beginning, be able to read French and German with ease and to make use of works in them.

REQUIREMENTS FOR THE DOCTOR'S DEGREE

1. The ability to read at sight specimens of scientific French and German, tested before the first of November preceding the Doctor's examination by a committee of two members of the Faculty.

2. The successful passing of an examination upon the general subject of Experimental Physics[1] and upon the subjects named above in the regular course in Theoretical Physics, as a major requirement, together with an examination in one minor subject, *to be determined in each particular case by the head of the Physical Department.* This subject will be Mathematics or Chemistry.

3. The presentation of a satisfactory dissertation, involving a substantial amount of original work, and forming a contribution of value to pure science. The presentation of the dissertation is a prerequisite to examination. The time of residence necessary for the proper fulfilment of the above requirements will generally be at least three years, of which at least one will be very largely devoted to work on the dissertation. Students will not be encouraged to enter upon the work of a dissertation until they have acquired sufficient experience to enable them to specialize with advantage.

The aim of the department is to produce physicists rather than electricians, acousticians, opticians, engineers, or narrow specialists of any sort, for although in the nature of things one will be obliged to know more of one subject than of others, yet it seems evident that no thorough knowledge of any branch can be gained without a comprehensive view over the

[1] Every student is recommended to provide himself with Winkelmann's *Handbuch der Physik* as a work for continual reference.

whole subject. Without this the specialist, or the experimentalist lacking a knowledge of mathematics, will continually be falling into pitfalls which the more wary avoid. Furthermore it can be but a detriment to science to encourage research in new fields by immature and ill-prepared minds and hands.

The following statement is here inserted for the benefit of students of mathematics.

The minor in Mathematical Physics consists of the subject-matter of courses 1, 2, 3, and 10, which are intended to constitute the equivalent of five hours a week for one year. Course 10 is given in alternate years to the other courses. The subject-matter of the course is contained in Dr. Webster's treatise on *Dynamics* and his work on Partial Differential Equations, now in press.

THE LABORATORY

The laboratory occupies three floors of one wing of a large well lighted building free from disturbances, and admirably adapted to the purposes of a physical laboratory. On the ground floor is a room extending across the end of the building forty-five feet long by twenty-two feet wide, with windows on three sides, above which are three similar rooms. A lift running from the bottom to the top floor affords means of transporting apparatus, while its shaft furnishes space for manometer or barometer tubes. In the lower room are four piers with heavy stone tops, and two others below the floor on which can be placed heavy tables.

Also on the ground floor is a large dark room, partially below ground, in which the temperature is tolerably constant, containing a very large and heavy pier. The engine and storage-battery room contains a kerosene engine and dynamo on the same foundation and sixty storage cells of ten amperes capacity, constituting the power-supply. The engine may be started at a few moments notice, even at night, but has

been superseded for most purposes by a motor-generator which is driven by an external supply and furnishes all needed direct current. The storage cells are conveniently arranged so that each one is accessible from each side, from above and below, and the ventilation is excellent, while the room is as light and clean as the work-rooms. Distributing switchboards allow the current from the dynamo or any section of the battery to be supplied to any of the rooms. On the same floor are three rooms constituting the workshop, one of the most important parts of a research department of physics. The first room is devoted to wood-working and pattern-making, and accommodates also a bench for soldering. The next room contains the machinist's bench, two engine-lathes and milling-machine, and the third room a Rivet precision bench-lathe, jeweler's lathe and drill-press. There is no countershafting in the building, each tool being driven by a separate electric motor, so that perfect quiet and steadiness are ensured. In the shop are executed all repairs and alterations of apparatus, and the new apparatus requiring continual experiment is constructed. Most of the principal pieces of apparatus belonging to this department have been thus constructed. In this manner, by having a mechanic always present, an extremely great economy in time and money is effected, and vexatious delays, which would otherwise completely arrest the progress of the work, are avoided. Facilities and encouragement are given to the students to construct apparatus for themselves.

On the main floor are the lecture room, the director's office, the large room used as the director's private laboratory and apparatus room, and three other convenient rooms for research. Two of these are arranged so that they may be darkened for photography, and one is heavily padded with felt for acoustical researches. The large room on the top

floor is diagonally divided into two, one dark and devoted to the Rowland twenty-foot diffraction grating, and with a photographic dark room attached. Close by is a high potential battery of two thousand small storage cells. Every room in the laboratory contains sinks, gas and electric light connections, and several circuits connecting with the switch-board in the battery-room.

The laboratory is well equipped with apparatus for research, besides having the facilities above described for the construction of instruments of any sort needed for that purpose. In addition may be mentioned a large collection of diagrams illustrative of mathematical physics, many of them being originals of the figures in Professor Webster's "Electricity and Magnetism" and "Dynamics," and a number of interesting models used in teaching dynamics, thermodynamics, and electricity. Among them are Maxwell's Dynamical Top and a number of other interesting tops, Maxwell's and Rayleigh's induction models, Gibbs's, van der Waals's and other thermodynamical surfaces. This collection of drawings and models can probably not be matched in this country, and is continually being increased.

The laboratory affords so much space that it is rarely necessary to put more than one student in a single room. Every student receives personal attention in the laboratory from the professor whenever he needs it, and is continually in receipt of instruction and suggestion by personal contact, the best form in which information can be imparted. Emphasis should be laid on the advantage to the research student of the contact with a professor who has no other duties or interests than the furtherance of research, in an institution devoted to this as its main object.

In the library Clark University has one of its strongest features. With a large separate building, administered in the most liberal manner with a view to the advantage of the research student, and with ample funds for the purchase of books, its facilities in the Department of Physics can hardly be surpassed. It may be said to contain all of the most important works in many languages, and is continually kept up-to-date, any book wanted needing only to be mentioned to be procured. The library is particularly rich in journals, among which are included the transactions of the learned societies of England, France, Germany, Italy, Austria, Holland, and Belgium. Other sets are being continually added. A list of journals will be found on pages 50–55. There are few subjects connected with physics which may not be thoroughly studied in this library.

III. CHEMISTRY

It is the purpose of the Department of Chemistry to provide the student with that broad training in the fundamental principles of chemistry which shall adequately equip him for a subsequent scientific career.

A considerable proportion of the students entering this Department naturally look forward to an academic career. It is not intended, however, to provide training for such men alone; for the equipment for technical research, whether for public or private interests, requires equally a thorough familiarity with the fundamental underlying principles of science and with the methods of experimental investigation.

Whether a student shall devote himself to pure or to technical research is a matter of individual interest and inclination rather than of training. The purpose of the Department is to provide the training on lines sufficiently broad to enable the student to exercise a choice between technical and purely scientific work.

REQUIREMENTS

In addition to the formal requirements for entrance to the University, the student entering the Department of Chemistry should have a thorough knowledge of the fundamentals of chemistry, including general chemistry, qualitative and quantitative analysis, organic chemistry, and the elements of physical chemistry. The student should also have had mathematics through the elements of the calculus, and not less than two years' work in physics, including general physics, the elements of thermodynamics with labo-

ratory work in heat, and the elements of the theory of electricity and magnetism with laboratory work in electrical measurements.

Students entering this Department, who have not had the work in both physics and mathematics as outlined above, will be expected to make up the deficiency during their first year. Excellent courses in these subjects, which are open to University students, are offered in the College. Students whose training in chemistry falls below the requirements above outlined, but who have had more extended courses in physics and mathematics may be allowed to enter the Department on condition that any deficiencies in chemistry will be made up during the first year.

A reading knowledge of French and German is indispensable for advanced work in chemistry.

Students who have done graduate work in other universities may enter the Department of Chemistry, receiving credit for residence (excepting the last year), provided the work done has been of such character as to provide the student with the necessary training.

INSTRUCTION

In order that a student may receive a broad training in chemistry, it is necessary that his time be properly distributed between class room work, research work, and library work. The Department endeavors, therefore, to keep the student occupied with these three lines of effort, without exclusion of one or more of them.

The following courses of instruction are offered:

1. Theoretical Chemistry I. Dr. Kraus. Lectures, conferences and problems. After developing the fundamental conceptions of thermodynamics, a study is made of systems comprising phases of constant composition. This is followed with a study of gaseous equilibria and

heterogeneous equilibria in systems comprising phases of constant composition.

2. Theoretical Chemistry II. Dr. Kraus. A continuation of the preceding course. The Nernst Heat Theorem is first examined together with allied matters. This is followed by a study of equilibria in systems comprising any number of phases of variable composition including electrolytic solutions. This course extends over two years.

3. Inorganic Chemistry. Dr. Kraus. This course consists of conferences in which the various elements and their compounds are discussed. The students are given numerous references to the literature. It is intended here to familiarize the student with the properties of matter in its more important forms and to bring his knowledge down to that of the current literature. Both physical and chemical properties are considered. This course thus becomes supplementary to the two preceding ones. It extends over three years.

4. The Phase Rule. Dr. Kraus. Conferences with references to the literature. A study is made of one, two and three component systems including both metallic and non-metallic substances.

5. Dispersed Systems. Dr. Kraus. Conferences with references to the literature. This course is devoted to the study of colloids and of surface phenomena in general.

6. Photochemistry. Dr. Kraus. Lectures and conferences. A study is made of the influence of radiations on chemical reactions.

7. The Process of Electrical Conduction. Dr. Kraus. Lectures and conferences. A detailed study is made of the conduction process in gases, electrolytic solutions, fused salts and metals.

8. Properties of Radioactive Elements. Dr. Kraus. Lectures and conferences. This course is devoted to a study of radioactive substances and the radiations accompanying their transformations.

9. History of Chemistry. Dr. Merigold. A course of lectures accompanied by supplementary reading. This course is intended to cover the historical development of the science in both practical and theoretical aspects. An attempt is made to give the student some knowledge of the individuality of the men whose work has resulted in the growth and development of modern chemistry. Attention will be given also to the relation of chemistry to other sciences at various periods of development.

10. Advanced Analytical Chemistry. Dr. Merigold. In this course will be considered special features of analytical chemistry, both

practical and theoretical. The work will include such topics as special analytical methods with particular reference to sources of error, limits of accuracy, and theoretical considerations; methods of exact analysis required in atomic weight work and other fields of research necessitating precise analysis. Particular attention is paid to results of recent investigation in this field.

11. Organic Chemistry. Dr. White. Conferences are held at which the fundamental conceptions and problems of organic chemistry are dealt with in a systematic way. Current literature, applicable to the subjects under discussion, is reviewed. The course extends over three years.

12. Research Conference. Dr. Kraus. This course is devoted mainly to a discussion of investigations which are being carried out in this laboratory.

13. Glass Blowing. Dr. Kraus. A brief course in the manipulation of glass, quartz, etc.

(Courses 1, 2, 3, 4, 8, 9, 11, 12 and 13 are given during the present year. Courses 1, 2, 3, 5, 6, 7, 10, 11, 12 and 13 will be given during the year 1916–1917.)

Minor Subject. Students choosing chemistry as major subject will be expected to take a minor in mathematics, physics, or biology. The choice of a minor subject will be made with reference to the student's previous preparation and to his ultimate aims as an investigator.

Research. In order that the student may become familiar with the methods of research and gain a knowledge of the minute details of one or more branches of chemistry he will carry on one or more researches throughout his three years of residence. Such researches will in all cases be in part experimental in nature. The subject for research may be one suggested by the student or one suggested by the instructor. In any case, the different investigations carried on in the laboratory at any one time will be largely diversified in order that the students may come into intimate contact with as many branches of chemistry as possible.

Since the student's early investigations will in all likelihood be more or less determinative of the subsequent trend

of his scientific activities, his subject for research is chosen with much care and, if possible, he is given several subjects during the course of his three years' work in the laboratory. In addition he is expected to make himself thoroughly familiar with the details of the investigations of his fellows in the laboratory.

Library Work. It is essential that the student shall acquire an adequate contemporaneous knowledge of the entire field of chemistry. This can be done only by reference to the original literature, both past and current. He is expected, therefore, to devote a considerable portion of his time to familiarizing himself with the journals, periodicals, and other important sources of information available in the Library. The various courses are given in such manner as to lead the student on in this direction.

FACILITIES

Laboratories. The Chemical Laboratories occupy the third floor of one wing of the Science Building. The floors below are occupied by the Collegiate Department of Chemistry. In addition to store rooms, offices and the Directors' Laboratory, room is provided for nine investigators. Not more than two students are assigned to one laboratory.

In addition to the usual equipment of a chemical laboratory, the following apparatus may be mentioned as being available for research work: A special water still for "conductivity water;" a 2-kilo balance, sensitive to one-tenth milligram; a Hilgar quartz spectograph; a Pulfrich refractometer; a Leeds and Northrup conductance apparatus, including a bridge, air condenser, telephone, and oscillator, and two one hundred and eleven thousand ohm resistance boxes (Curtis's wound); a ten thousand ohm resistance box in steps of one-tenth ohm, a Leeds and Northrup New High Sensitivity Galvanometer, several less sensitive D'Arsonval

Galvanometers, a Leeds and Northrup Potentiometer, a platinum resistance thermometer together with bridge, several large capacity vacuum pumps giving pressures as low as 0.00005 mm., thermostats, motors, vacuum jacketed tubes, McLeod gauges, etc.

Through the courtesy of the American Academy, there has been placed at the disposal of the Department a specially constructed assay balance sensitive to one one-thousandth milligram provided from the Warren Fund and an automatic refrigerating machine provided from the Rumford Fund.

The Department is provided with a laboratory shop which includes a grinding wheel and bench lathe with accessories, and a complete equipment of small tools. The Physics Department has a well equipped shop with a competent mechanician in attendance whose services may be arranged for when required. The laboratory shop is merely intended to be used when its use serves to save time. The shop is also equipped with an oxy-acetylene welding outfit.

Since glass apparatus forms a large part of the necessary equipment for research, the laboratory provides a complete stock of glass tubing. This includes ordinary soda glass in all sizes, which is used chiefly for glass blowing exercises; a complete stock of lead glass employed in the construction of apparatus; a stock of special glass of coefficient 3.5×10^{-6}, which is employed in apparatus where the conditions of use are especially severe. In addition there is available an unusually good stock of transparent quartz tubing, as well as of electro quartz.

A complete stock of all ordinary supplies, such as stopcocks, stoppers, rubber tubing, quartz ware, etc., is always kept on hand.

The Department is always ready to purchase special ap-

paratus or materials required for research work, while the equipment of permanent apparatus is constantly being added to.

THE LIBRARY. The library facilities which the University affords to students in chemistry are the best obtainable. Complete sets of journals and periodicals are kept on file, together with text books, treatises, etc. New books are placed on display on the library tables and such as are of value are ordered on request.

The student has free access to the shelves and files. Tables are assigned in proximity to the book shelves where the student may leave permanently books and papers with which he is engaged. A more detailed description of the library facilities will be found elsewhere.

SCHOLARSHIPS AND FELLOWSHIPS

A considerable number of scholarships and fellowships are available for students in this Department under conditions set forth elsewhere.

DOCENTS AND HONORARY FELLOWS

Docents and Honorary Fellows are appointed under the conditions as set forth elsewhere. The Department welcomes such men as have already obtained their Doctor's degree and who for one reason or another wish to devote themselves for some time to research work. Every facility and encouragement will be afforded such men for the furtherance of their work.

DEGREES

MASTER OF ARTS. The formal requirements for this degree do not necessarily include an original investigation on the part of the candidate. However, the candidate must demon-

strate that he possesses a working knowledge of the fundamental elements of the Science of Chemistry. Obviously, in the case of a science so largely founded on experimental facts as is chemistry, the power to carry on an experimental investigation constitutes one of the most simple and direct means for demonstrating that the candidate possesses the necessary scientific qualifications for this degree.

Doctor of Philosophy. The formal requirements for this degree are given elsewhere. Among other things, they include three years of residence (or its equivalent in other institutions), with attendance on lectures, and the successful completion of an investigation which constitutes a contribution to the Science of Chemistry. The requirements for a degree cannot, however, be fulfilled by merely observing the formal requirements as to residence, attendance on lectures, and the like. On the contrary, while all formal requirements must be scrupulously fulfilled, to receive the degree of Doctor of Philosophy, the candidate must clearly demonstrate that he possesses those scientific attainments which are essential to an active and productive scientific career.

IV. BIOLOGY

The work of the biological department has reference chiefly to the problems of general physiology, *i.e.*, problems dealing with or bearing upon the peculiarities of vital processes as such. In modern physiology living organisms are regarded as material systems having special and highly distinctive characteristics which are subject to analysis by the methods of the exact sciences. The problems presented by the living cell—a system consisting largely of colloidal material and distinguished by the possession of metabolism and other unique peculiarities—are most effectively approached from this point of view, and fundamental progress in general physiology has been due chiefly to the application of the sciences of physics, chemistry and physical chemistry to the analysis of the vital processes. The biological department offers instruction and facilities to those interested in the application of the physical and chemical sciences to the problems of general physiology. Students and investigators in this field will find unusually good opportunities for gaining the requisite knowledge of physics, chemistry and especially physical chemistry, and every effort will be made to correlate their work in these departments with their physiological work. Students of the physiological analysis of the reactions and behavior of normal intact organisms are offered the further advantage of coöperation with the department of psychology. Work in the physiology of development, comparative physiology, general pharmacology and other fields of research in which marine animals are especially valuable may be conducted during the summer at the Marine Biological Laboratory at Woods Hole under

the direction of Professor Lillie, and credit for work done at Woods Hole will be given in Clark University.

The laboratory is equipped with the usual apparatus and materials for work in general physiology. Any additional apparatus, animals or chemical reagents required for the purposes of any special research will be provided wherever possible. The conditions are especially favorable with regard to scientific literature. Complete files of nearly all of the important journals in zoölogy, physiology and biological chemistry are in the library, as well as a large number of special works in these sciences, and literature in other biological fields (botany, medicine) can be procured on short notice.

For admission to the laboratory students should have had adequate previous training in biology, chemistry and physics. Resident men students whose preparation in these subjects is insufficient may remove these deficiencies by taking the courses offered in Clark College. Students desiring to attend lecture courses without taking laboratory work can make special arrangements to do so.

The following courses are offered:

1. Fundamental Problems of General Physiology. This course is introductory and will deal chiefly with the physiology of the living cell from a physico-chemical point of view. The subject matter will be divided somewhat as follows: The distinctive characteristics of living as distinguished from non-living matter; chemical composition of the cell; enzyme action; the physico-chemical constitution of the cell; the nature and significance of cell-organization; the importance of the colloidal state in physiological processes; the rôle of electrolytes; the physiology of stimulation, contractility, and related processes; the general reactions and elementary behavior of intact organisms (tropisms, etc.); the general characteristics of metabolic processes (oxidations, syntheses, interchange with surroundings); cell-reproduction, fertilization, development and heredity. Dr. Lillie, *two lectures weekly, October to June.* Students with sufficient preparation will be assigned laboratory work in connection with these topics.

2. Special Problems of General Physiology. A more advanced

course of lectures will be given on topics of general physiology, having especial reference to the problems under investigation in the laboratory. Hours will be arranged to suit requirements. Dr. Lillie, *October to June.*

3. Biological Seminar. The Seminar will meet once a fortnight to present results of research and to review and discuss recent literature. *October to May.*

4. Special Topics in Biological Chemistry. The aim of this course is to present in greater detail than is usually possible in a more general course, certain subjects of particular interest to students intending to undertake biochemical research. The subject at present offered is organic chemistry with especial reference to compounds and processes of biological interest. The discussions will include the physical and chemical properties of such compounds, their metabolism, and general physiological significance. Dr. White. *One lecture weekly, October to June.*

V. PSYCHOLOGY

A complete course in Psychology at Clark University inludes the following subjects:

1. Anatomy and Physiology of the Brain and Spinal Cord, sense organs, and other parts of the body, especially the muscles—the organs of the will—in so far as they are concerned with mental processes—together with a good general background of biology. For this a special laboratory is equipped.

2. Physiological and Experimental Psychology, including an outline of the anatomy and physiology of the central nervous system and sense-organs; the elementary sense-experiences; sensation and perception; the measurement of sensational intensity; space; time; reaction-times; affection and emotion; memory; association; attention; apperception; will; the "higher mental processes;" inter-relation of mind and body. For this a special laboratory is equipped.

3. Comparative and Genetic Psychology. Review of the general doctrine of evolution as a basis for the evolution of mind. Discussion of experimental and observational studies upon typical forms of animal life, beginning with the protozoa. Instincts; animal and human infancy. Childhood and adolescence.

4. Abnormal and Morbid Psychology, as nature's experiments, *e.g.*, border-line phenomena as seen in neurotic subjects, prodigies, and geniuses; defectives, such as the blind, deaf, criminal, idiotic; mental and nervous diseases, epilepsy, phobias, neurasthenia, hysteria; morbid modifications of will, personality and emotion, etc. Special clinical facilities for this work are open to the department in the hospitals and other institutions of the city.

5. History of Psychology and Philosophy, including the chief culture institutions, science, medical theories, Christianity, and education generally.

6. Applications of Psychology, Pedagogy, including mental and moral hygiene and regimen, school organization and methods from kindergarten to university; the sex problem; defectives, etc.

7. Psychoanalysis. Freud, Janet, Jung, Adler and others. The mechanisms are considered less in their applications to sex than to fear, anger and other emotions. The psychoanalysis of great men. Dreams, hypnotism, multiple personality, somnambulism, and the more common forms of neuroses and psychoses, the psychology of everyday life.

The aim of the Psychological Department is to cover this field as well as its instructors are able to do so in two or three years.

The following courses are announced for the academic year 1916–1917.

Dr. Hall's Courses

Dr. Hall's courses are as follows:

1. The Psychology of the Feelings and Emotions. This course will involve a brief sketch of the history of the theories in this field and a much more extended account of the recent experimental, clinical and genetic work done in this department. The purpose of the course is to give a clear account of the present condition of our knowledge of each of the feelings, one after another, pleasure and pain, fear, anger, sympathy, jealousy, love, hate, etc.

2. Psychogenesis. This course will begin with an account of the theories of the origin both of life and of mind, with chief emphasis upon the latter. There will be a survey of the results of experimental biology, concerning elemental life or substances that resemble it, then experiments and observations upon the simplest organisms. This will be followed by a résumé of our knowledge of certain typical forms of animal instinct up the series, and upon this basis the contributions to paleontology will be drawn upon and certain lessons as to the development of the instinct of type forms of life; the horse, camel, monkey and other typical forms will be dwelt upon at some length. This will be followed by a brief account of culture stages of the human race from the paleolithic age and that of the troglodytes up.

3. The Psychology of Religion. This falls into two halves:—first, the origin of religion, from animism and manaism up to the ethnic religions other than the Hebrew and Christian; the latter, focussing in the psychology of Jesus, constituting part two.

4. The Psychology of Appetite, Foods and Nutrition.

5. Some Vital Problems in Education. This course will be given Saturdays for teachers and the special field it covers will be announced later.

6. The Seminary, at Dr. Hall's house, three hours every Monday evening through the year.

7. Researches with individuals on special topics.

EXPERIMENTAL PSYCHOLOGY

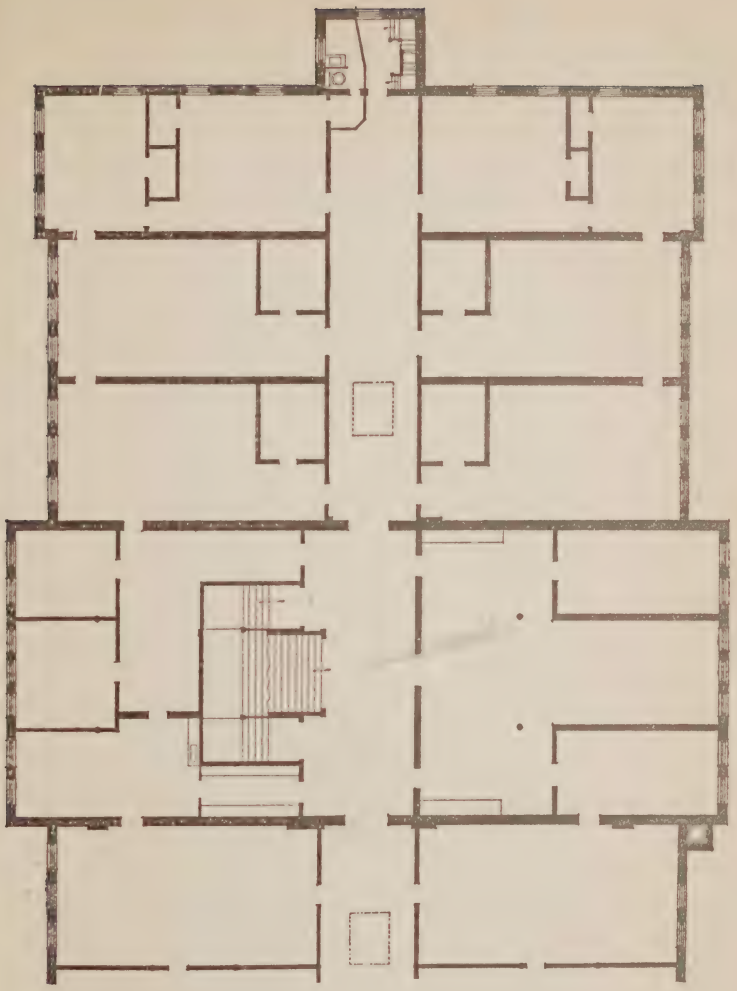
The primary purpose of this department is to train students for the investigation of psychological problems. The lecture courses and the Journal Club aim to familiarize the student with the history and the present status of psychological experimentation; the laboratory courses are arranged with a view to training him in experimental procedure, and equipping him for independent research.

LABORATORY

The psychological laboratory occupies a suite of twenty rooms on the upper floor of the main building of the university. These rooms, as at present arranged, are devoted to the following purposes: office, lecture-room, seminary and reading-room, dark-room, work-shop, general apparatus-room, and a group of rooms for research.

The laboratory is well equipped with general apparatus; and it has an annual appropriation sufficient to provide for the purchase and manufacture of such apparatus as is required from time to time for special investigations. The work-shop contains power- and other lathes, a power-drill, and an abundant equipment of tools and materials for the manufacture and repair of apparatus. The services of an expert mechanician are available; and every facility is provided for the devising and constructing of apparatus appropriate for the solution of such special problems as are undertaken.

The library contains an unusually large collection of psy-



PSYCHOLOGICAL LABORATORY

chological literature. It is especially well supplied with scientific periodicals and proceedings of learned societies. Since the enrolment of the department consists exclusively of graduate students, and is, therefore, relatively limited in numbers, it is possible to give to each student of the department a maximum of freedom in the use of the library. Besides having access to the university library, students of the laboratory have at their disposal an excellent working-library of psychological books and periodicals which are shelved in the seminary-room.

The more general and fundamental courses of lectures in the department are repeated each year, while the more advanced and specialized courses are given only in alternate years. A feature of the method of instruction at Clark University is the frequent informal conferences between instructor and student. The Journal Club meets weekly (two-hour sessions) for the discussion of the current literature. The more valuable contributions presented by the members of the Club will be published in the *American Journal of Psychology*. The laboratory work includes an introductory and a research course. The former is designed to familiarize the student with the efficient handling of apparatus, and to acquaint him with the methods to be followed and the precautions to be observed in psychological experimentation. This course is repeated each year; it, or its equivalent, is a prerequisite to all other work in the laboratory. The research varies from year to year.

Provision for Comparative Psychology is now made at the Hadwen Arboretum, about fifteen minutes' walk from the main building of the University, where special facilities for the care of the animals have been provided.

DR. BAIRD'S AND DR. FERNBERGER'S COURSES

1. General Psychology. A course of lectures and demonstrations dealing with sensation, affection, attention and perception. This course

will present, in concrete and systematic form, the more important facts that have been yielded by the experimental investigation of the simpler mental processes, together with a discussion of theories that have been advanced from time to time. Dr. Fernberger. *Two hours a week. First semester.*

2. The Neurological Basis of Psychology. An elementary course dealing with the anatomy and physiology of the central nervous system and the organs of special sense. The work will be covered partly by lectures and partly by actual dissection. The central nervous system will be considered from the functional aspect as well as a consideration of the gross and microscopic anatomy. Dr. Fernberger. *Two hours a week, January to April.*

3. The Application of Statistical Methods to Psychology. A course of lectures and demonstrations in which will be considered the calculations necessary for the practice of the psychophysical methods and also the relation between the methods. The distribution of relative frequencies, correlation and similar topics will also be considered. Dr. Fernberger. *One hour a week. First semester.*

4. Laboratory Work in Psychological Statistical Methods. In this course a limited and selected group of students will be given practice in the actual calculations and in the acquiring of the data that will form the basis for these calculations for the different methods discussed in Course 2. Dr. Fernberger. *Two or three hours a week. Second Semester.*

5. The Psychology of Language. A course of lectures dealing with an analysis of the language function, with special reference to the study of the aphasias. In this course will also be considered the anatomical basis of language, the origin of language ontogenetically and phylogenetically considered, as well as such special topics as the psychology of reading. Dr. Fernberger. *One hour a week. Second Semester.*

6. The Psychology of Memory, Imagination and the Process of Learning. Lectures and demonstrations dealing with the phenomena of mental acquisition and retention; imagery, association and reproduction, the phenomena of learning and forgetting, the function and development of habits. Dr. Baird. *Two hours a week. Second semester.*

7. The Psychology of the Higher Intellectual Processes. The psychology of meaning, abstraction, thought, judgment, reasoning; the function and significance of imagery; the phenomena of *Bewusstheit*, *Bewusstseinslage*, *Aufgabe*, *Einstellung* and *determinierende Tendenz*. Dr. Baird. *One hour a week.*

8. History of Psychology. An outline of the development of psychological thinking; a statement and discussion of the characteristic features of the systematic doctrines embodied in the writings of representative psychologists, past and present. Dr. Baird. *One hour a week.*

9. German Translation. A course for the rapid reading of a German psychological text. Dr. Baird. *One hour a week.*

10. Comparative Psychology. A description and discussion of investigations of animal learning. Dr. Baird. *One hour a week.*

11. Journal Club. A seminary for the informal discussion of current psychological literature. Meetings are held weekly throughout the year.

12. Introductory Experimental Course. In this course the student will perform a series of standard psychological experiments, chiefly for the purpose of mastering the technique of experimentation. The course will be given by Dr. Baird, Dr. Fernberger and Mr. O'Brien. *Four to six hours a week, throughout the year.*

13. Advanced Experimental Course. The object of this course is to acquaint the student with the technique of some of the more complicated apparatus used in psychological experiments. The use of the plethysmograph, pneumograph, ergograph, tapping experiments, methods of time measurement, methods of presentation of material and the like will be investigated. The student will also become acquainted with all of the special apparatus in the possession of the laboratory. Dr. Fernberger. *Two hours a week. First semester.*

14. Research Course. Under this title are grouped the special investigations undertaken by students in the laboratory. *Topics and hours to be arranged.*

DR. KARLSON'S COURSE

1. History of Philosophy. The work in philosophy at Clark University is essentially limited to a thorough, though introductory, course, including lectures and texts covering the entire history of philosophy from Thales to Schopenhauer, both inclusive, as fully as can be done in two hours a week. The instructor makes no attempt to teach systematic philosophy, logic, ethics, metaphysics, psychology, or any of the special disciplines, and deals with the history of philosophy in the sense of Zeller, Fischer, Ueberweg, and the rest, in the historic spirit, with some biographical matter, teaching the chief opinions of each important man and then passing to another, and not stressing any of the above specialties. The idea is that the historian should be meta-

physician, logician, ethicist, epistemologist, psychologist, etc., just as much as was the man whose system he is expounding for the time, chiefly finishing one author before passing to another, following largely the chronological order, and teaching each system more as literature than as dogma, avoiding indoctrination, and teaching every doctrine or view sympathetically, letting the systems criticize each other, and in general reserving his own criticisms until after his sympathetic presentation has been made, and striving to fit for our examination in such a way that we can plan ultimately to require this course of all who take degrees in psychology or education. *Two hours a week.*

2. The following course may be offered in CONTEMPORARY PHILOSOPHY: A discussion of the philosophy since Schopenhauer, dealing chiefly with the Naturalistic, the Pragmatic, the Realistic, and the Idealistic tendencies in present day philosophy. Special emphasis is laid on the philosophy of such men as Nietzsche, Haeckel, Bergson, Eucken, James, etc., and an evaluation of their philosophy is attempted. The relation of present day science to philosophy will be discussed. *One hour a week. First semester.*

DR. PORTER'S COURSE

COURSE IN MENTAL EVOLUTION AND COMPARATIVE PSYCHOLOGY. Lectures on reflexes, tropisms, instincts, habit-formation, the learning process, and other mental processes in animals. Especial emphasis will be placed on methods of experimental investigation and interpretation of results. The facts and laws of animal behavior and the relation of these to the various branches of human psychology, and other social sciences will be discussed. Some attention will be given to the applications of the findings of the study of Animal Behavior to Nature Study. Lantern slides, charts and demonstrations with apparatus with animals and human subjects. *One hour a week. First semester.*

The following courses offered by Professor James P. Porter in Clark College are open to students in the University:

1. GENERAL PSYCHOLOGY. Three hours a week, throughout the year.

2. SOCIAL PSYCHOLOGY. Three hours a week, throughout the year.

3 a. THE EVOLUTION OF MIND AND GENETIC PSYCHOLOGY. Three hours, second semester.

3 b. EDUCATIONAL PSYCHOLOGY. Three hours, first semester.

4. LABORATORY COURSE IN EXPERIMENTAL PSYCHOLOGY. Three hours a week, throughout the year.

5. Advanced Psychology. Attention, feeling, emotions and will. A lecture and seminar course. Three hours, throughout the year.

At the Hadwen Arboretum, where a "station for the study of animal behavior" has been established and is now under Dr. Porter's direction, are found facilities for the study of certain forms of animal life; and here too will be found some of the illustrative material for his lectures.

Psychiatry

Dr. Cowles, lecturer on Psychiatry, former head of the McLean Hospital at Waverley, Mass., will give a course at the University and the Worcester State Hospital for the Insane. Dr. Cowles's course includes the following topics with clinical demonstrations.

The Melancholia-Mania Group of Neuropsychoses:

1–2. The dependence of Psychiatry upon Mental and General Physiology; the concept of energy fundamental; the reflex arc and integrative action of the nervous system. Relation of inhibition to anabolism, and katabolism.

3. Conduction-paths and Threshold Values: changes in physiological conditions in relation to the determination of psychical effects—normal habit—overuse and disuse—mental symptoms.

4. The Physiology and Pathology of Emotion; depression and exaltation figurative expressions in psychology, both being excitative and katabolic; relations of feeling-tone to conditions of ill-being.

5. Psychasthenia and Neurasthenia; the minor psychoneuroses—psychological automatism, fixed ideas, hysteria.

6. Mental Symptoms of Nervous Exhaustion; their genesis in reductions of functional capacity of the nervous and mental mechanism.

The Deteriorating Psychoses:

Involution psychoses, paranoia. 7–10. Dementia praecox, genera paresis, senile dementia.

VI. PEDAGOGY

This department offers a course which can be taken for the degree of Doctor of Philosophy. Its work is in the closest connection with that of psychology and anthropology, and in part based on these subjects. The work in this department is intended to meet the needs of the following classes of students.

First. Those intending to teach some other specialty but who wish a general survey of the history, present state, methods, and recent advances in the field of university, professional and technical education.

Second. Those who desire to become professors of pedagogy, or heads or instructors in normal schools, superintendents, or otherwise to become experts in the work of education.

The programme of the Pedagogical Department includes courses or part-courses upon the following subjects:

1. (*a*) Child Study. (*b*) Pedagogical Psychology. (*c*) Experimental Pedagogy. (*d*) School Hygiene.

2. (*a*) Principles of Education. (*b*) History of Education and Reforms. (*c*) Methods, Devices, Apparatus, etc.

3. (*a*) Organization of Schools in Different Countries. (*b*) Problems of College Education. (*c*) The Teaching Profession. (*d*) Motor Education, including manual training, physical education, etc. (*e*) Moral and Religious Education. (*f*) Ideals.

The courses in pedagogy for 1916–1917 will be as follows:

DR. WILLIAM H. BURNHAM'S COURSES

A. The Hygiene of Instruction. The conditions of brain activity. The principles of mental hygiene. The laws of nervous activity and the learning process in relation to problems of instruction. Fatigue.

The period of study. Recesses. The optimum conditions of school work. The hygiene of the kindergarten. The hygiene of spelling, reading, writing, arithmetic, manual training, physical training, etc. The hygienic aspects of grading, of examinations, of discipline, of punishment, etc. *One hour a week, throughout the year.*

B. The Teaching Profession. The essential characteristics of a learned profession. The teacher and the parent. The teacher and the artisan. The teacher in ancient civilization; in China, India, Greece, Rome, etc. The medieval teacher. The teacher of the early Renaissance. The Reformation. The great modern schoolmasters, Sturm, Comenius, F. A. Wolf, Pestalozzi, *et al.* The teaching profession in Germany. The function of the teacher in social evolution. The function of the teacher in the schoolroom. Characteristics of the teaching profession as a social group. Fundamental principles concerning the training of teachers. Different plans tried in this and other countries, especially in the training of secondary teachers. The hygiene of teaching. *Once a week, throughout the year.*

C. Seminary. The work will be determined in part by the needs of the students who elect this course. It is hoped that each student will select, after consultation with President Hall and Dr. Burnham, a topic for special investigation. The results of such studies may be published. *One or two hours a week, throughout the year.*

PRESIDENT G. STANLEY HALL'S COURSE

Some Vital Problems in Education. See special circular later.

DR. EDMUND C. SANFORD'S COURSE

Educational Principles in the Light of Biology, Psychology and Sociology. The aim of the course has been to present briefly those fundamental conceptions which have a direct bearing on educational theory and practice; the characteristics of living matter, innate tendencies and plasticity, the rôle of the nervous system, growth and adaptation, psychic factors in learning, formal and informal education, social needs and educational ideals.

The courses as announced above may be modified some-

what as the needs of the students or other circumstances may require.

THE CHILDREN'S INSTITUTE

The Children's Institute, under the auspices of the Educational Department of Clark University, provides lectures each year, in the small lecture-room on the second floor of the new wing of the library building, from nine to ten o'clock on Saturday mornings, open not only to students but to all others interested. This work varies from year to year. During the present academic year Dr. Amy E. Tanner has lectured upon Child Study; Dr. Yoshihide Kubo upon Linguistic Development and Education; Mr. William L. Dealey upon Child Welfare Institutions.

The Children's Institute has a large hall with three adjacent rooms, comprising one entire floor in the new Library Building devoted to an educational museum, which is equipped with hundreds of maps, charts, diagrams, illustrative and other apparatus gathered from many countries, to ease the work of teaching and make it more effective. This material is used in various departments, but especially by that of Education.

Special attention has been given to the collection of the circulars and other publications of nearly one hundred types of child welfare organizations with which the department seeks to keep in touch.

THE LIBRARY

The library of the department has a large collection of EDUCATIONAL LITERATURE, being especially rich in German and French literature, and having a large number of official reports from various countries—English, French, German, Belgian, Swedish, etc.; also town and city reports, and reports of special institutions; and a collection of French, German, and American text-books.

The books are arranged under the following heads:

1. General.
2. History of Education.
3. Educational Systems.
4. The Theory of Education and Special School Subjects.
5. Educational Psychology.
6. Child Study.
7. School Hygiene and Physical Education.
8. Text-Books.
9. Miscellaneous.

Many of the more common educational books are accessible in the Worcester Public Library and have not been duplicated by the University. The large collection of educational text-books in the library of the American Antiquarian Society and its valuable historical material are also accessible to the University.

The collection of educational periodicals includes a large number of the best foreign journals—English, French, German, Swedish, etc.

The nucleus of an educational museum has been formed. This is now merged with the museum of the Children's Institute, and contains a valuable collection of educational apparatus, pictures, illustrative material for language lessons, *Anschauungsunterricht*, toys, kindergarten material, maps, charts, diagrams, text-books, lantern slides, moving picture films, photographs and illustrative material of various kinds in school hygiene, history, arithmetic, language, the natural sciences, etc. One room contains a collection of apparatus for the teaching of arithmetic, abacuses of various kinds, charts for counting, reckoning machines, number tablets, weights, measures, geometrical models, and astronomical charts and apparatus. Another room contains a collection of toys from different countries, a number illustrating scientific principles in physics and the like. A third room is

devoted to apparatus and illustrative material in school hygiene. The collection includes seats and desks, charts illustrating good and bad posture, hygrometers, apparatus for ensuring cleanliness, for testing the air, charts illustrating the incidence of school diseases, the effects of antitoxins, etc. and a collection of the antitoxins for the various diseases. The main room is largely filled with pictures, models, maps, charts, and illustrative material for teaching the different school subjects and the different sciences. During the year 1914–15, 450 charts, 900 lantern slides and 50 books have been loaned to teachers and students. The catalogue of the department of school hygiene in the museum has been published. Catalogues of the toys and of the department of history have been begun. This Museum is open to teachers, students, and the general public at definite times. It is now under the direction of Professor W. H. Burnham.

The *Pedagogical Seminary* is a journal issued at the University, and serves as a convenient medium of publication for special investigations undertaken in the department.

VII. SOCIOLOGY

The courses here outlined indicate the scope of the work offered. At least two hours work per week and a seminar are given each year. Courses 1, 4, and 5 were given in 1915–16.

1. History of Social Theories. A survey of the main contributions to sociological literature beginning with Auguste Comte. A partial list of the writers covered in 1915–16 is: Comte, Buckle, Bagehot, Spencer, Novicow, Worms, de Greef, Gumplowicz, Kropotkin, Oppenheimer, Small, Ratzenhofer, Ward, Giddings, Durkheim, Sumner, Boas, Ross, Cooley, McDougall and Ellwood. Each author is taken up in turn and his viewpoints and principles analyzed and discussed. *Two hours per week.*

2. General Sociology. A series of lectures dealing with social origins and evolution and sociological analysis. Topics treated include the origin of man, of races, and of society; primitive ideas; religion, its origin, evolution and function; the family; tribal society; the state; philosophies of history. The analysis of social factors treats the physiographic, biological, economic and psychological bases of society and such special processes as natural and artificial selection; communication; coöperation; competition; differentiation; socialization. *One hour per week.*

3. Problems of Population. Considers various laws of population as developed by Malthus, Spencer, Nitti and others; vital statistics, birth and death rates, heredity and selection with some attention to statistical methods; theories of racial decay; eugenics and race-regeneration; and biological and sociological conditions affecting the supply of genius. Lectures, reports, discussions. *One hour per week.*

4. Problems of Social Reconstruction. The development of the philosophy of individualism and *laissez-faire* as related to its historical conditions is sketched, its statement by Smith, Bentham, Mill and Spencer is analyzed, and its bearings and limitations considered. A discussion of the theories of justice is followed by a treatment of vari-

ous special problems, such as minimum wage, unemployment, and the distribution of wealth and income, and the basis and limitations of the movement toward collectivism. *One hour per week.*

5. Elements of Statistical Method. A course designed to familiarize the student with present methods of handling quantitative data in social science with special reference to various kinds of averages, and measures of dispersion and of correlation. *Two hours per week.*

6. Journal Club. Given to reports on theses and selected portions of the current literature. Special attention is given to the periodical literature dealing with population questions or with some phase of sociological inquiry. *One hour per week.*

VIII.

HISTORY AND INTERNATIONAL RELATIONS

The distinctive feature of the Department is the new value it aims to emphasize in the study and teaching of history. Without neglecting scholarly investigation in the economic, political and social life of preceding centuries, it seeks to know the past primarily the better to understand the present; to learn from a study of their historical evolution how the various nations and races have developed the characteristics and culture which mark them today; to gain a sympathetic appreciation of the best in other civilizations; and to evaluate correctly the problems and the difficulties constantly arising in the international relations of the family of states. The field of history covered is not limited to the United States and three or four of the older nations of Europe, but includes as well the newer and rapidly developing states of Asia, Latin-America and Africa. Political development is regarded as of no greater importance than economic, social and religious advance.

ANNUAL HISTORICAL CONFERENCES

In carrying out these features of its work, the Department has arranged annual conferences for the discussion of the history and the present-day conditions of various lands. In 1909 the sessions dealt with the Far East, including China, India, the Philippines and Hawaii; in 1910 with the Near East and Africa; in 1911 with Japan and Japanese-American relations; in 1912 with Recent Developments in China; in 1913 with Latin America; and in 1915 with the Problems

and Lessons of the World War. Altogether more than one hundred and seventy-five men have taken part in these conferences—university professors, anthropologists, leading natives, government officials, officers of the army and navy, travelers and missionaries—all of whom could speak with authority. The University students are enabled not merely to read the addresses and papers, which are issued in a series of bound volumes, but to listen to and meet these men who are both writing and making present-day history.

JOURNAL OF RACE DEVELOPMENT

The *Journal of Race Development* is another means for emphasizing present historical values. Published quarterly by the University, under the editorship of President G. Stanley Hall and Professor Blakeslee, assisted by a board of twenty-one contributing editors, the majority of them from the faculties of other Institutions, it has been a forum, during the past five years, for the discussion of the problems which relate to the progress of races and states generally considered backward in their standard of civilization. The *Journal* is of frequent service to the work of the Department, for it publishes from time to time articles and theses of advanced students, which show particular excellence.

COURSES

The various courses offered in the Department are so arranged, in cycles of two or three years, that students working for their doctorate will be enabled to secure a full program each year. Those taking History as a major are advised to elect their minor work in Sociology. In addition to the regular courses, a feature of the methods of instruction in the Department is the frequent informal conferences between instructor and student.

Professor Blakeslee offers the following courses:

1. United States History. Different periods are taken for intensive study in successive years. In 1914–15 the course dealt with the period from the close of the Civil War to the present time, and included the economic and social development of the country during these years as well as the history of politics. In 1913–14 it extended from the Missouri Compromise to the outbreak of the Civil War, with emphasis upon the years following the Compromise of 1850. It treated especially the institution of slavery as it existed in the Southern States, the origin and growth of the abolition sentiment, the doctrine of states rights and the development of the antagonism between the North and the South till its culmination in the Civil War. In 1915–16 it includes the period from the formation of the Constitution to the Missouri Compromise. A critical study is made of source material, as well as of the Standard authors. The lectures are supplemented by reports presented by students upon assigned topics. *Two hours.*

2. The Expansion of the United States. The history of the successive territorial acquisitions of the United States is given, including the diplomatic negotiations and the relations with foreign powers. This is followed by a study of the constitutional questions involved, especially those regarding the status of newly acquired possessions and of present-day dependencies; the differences between incorporated and unincorporated territory; and the rights and privileges of inhabitants and citizens of the various lands considered. The aims and the continuity of the American Colonial policy are pointed out. *One hour.*

3. The History of American Diplomacy. This course will treat of the international relations of the United States from its beginning as an independent nation to the present day. It will trace the gradual development of American foreign policy, point out its distinctive features, and show how it has differed from the diplomacy of other countries. A familiarity with the standard books in the field will be expected, and frequent reference made to such source material as Moore's Digest and the Foreign Relations of the United States. *Two hours.*

4. International Law. The aim of this course is to give a knowledge of the general principles of International Law. So far as possible definite cases are studied, and for that purpose Scott's "Cases on International Law" are followed. Especial attention is paid to the legal questions involved in the existing international controversies; to the history and present status of arbitration; and to the modifications in International Law introduced by such international Congresse

as those held at The Hague. During the past year, the problems in international law arising from the present war in Europe and from the relations of the neutral to the belligerent states, were given the closest study. A number of the most important legal issues between the United States, Great Britain and Germany have been argued, as in an international court. The leading authorities and the cases are supplemented by lectures and discussions. *Three hours.*

5. Russia. The lectures discuss particularly the revolutionary movement, including the abuses of autocracy and bureaucracy, the character and methods of the revolutionists, the economic and political ability of the peasants, the widespread acceptance of socialism by the educated classes, the influence of the church, the recent reforms by the government and the influence upon the Empire of the present war. *One hour.*

6. The Far East. The lectures deal with Russia in Asia; Japan, with its colonies, Formosa and Korea; Manchuria, including the history and present status of the struggle for its control; China and the revolution; the Philippines and Hawaii; and the international politics of the Far East and of the Pacific Ocean. *One hour.*

7. British Colonies and Dependencies. A survey of the important political, economic and social conditions in the leading British possessions, especially in Canada, Australia, New Zealand, India and Egypt; and a discussion of British colonial policy and problems. *One hour.*

8. Latin America. A survey of the history of the various countries is followed by a consideration of international diplomacy, political problems, systems of government, race questions, and economic and industrial conditions. Especial emphasis is placed upon the past and present relations, both in trade and diplomacy, between the United States and the countries of Latin America; this involves a careful study of the Monroe Doctrine. The lectures are based, in part, upon material which has been secured in a recent trip to South America. *Two hours.*

9. Historical Seminar. The students in the Department of History meet one evening a week in a seminar for the consideration of particular topics of historical interest and for the review of book and magazine material of especial value. Each member is expected to present reports which then form the basis for a general discussion.

The past year the Seminar devoted much of its time to a consideration of diplomatic problems, especially those relating to the European war and those in which the United States was a party. A critical study was made of the diplomatic correspondence relating to the various international controversies.

The present year especial attention is being given to a study of the development of Pan-Americanism.

During the year 1915–16, courses 1, 8 and 9 are given.

Dr. Gras offers the following courses:

1. The Economic History of Europe from 1300 to the Present. The work in this course consists largely of oral reports. These are commented upon by the lecturer and made the basis of general discussion. Such topics as the following are studied: the origin of towns, the decay of the manor, the rise of a free tenant class, the revolts of 1381 and 1525, the enclosure movement; the Hanseatic League, Italian commercial supremacy, the formation of national companies, the struggle for a market, the history of prices; medieval crafts, the domestic system of industry, the industrial revolution; mercantilism, the free-trade movement, modern protectionism, national economic regulation. The object of the course is in part to familiarize the student with the literature on the subject. A reading knowledge of French and German is of great service. *Two hours.*

2. The Economic and Political History of Europe since 1789. Lectures are delivered on such topics as the French revolution, the Napoleonic régime, the proletarian upheavals, the industrial revolution, the history of trade unionism, socialism and syndicalism, the formation of the German Empire and of the Kingdom of Italy, the struggles of the papacy. *Two hours.*

3. The History of England. From year to year special periods of English history are selected for intensive study (during the year 1915–16, the Tudor and Stuart periods). Although emphasis is placed upon insular developments, nevertheless the relation of English to general European history is regarded as an essential part of the work. *One hour.*

4. The Literature of English History: A study in Historical Criticism. In this reading course in English History, the students discuss with the instructor the various works recommended for study, such as those of Green, Freeman, Stubbs, Froude, Gardiner, Von Ranke, Carlyle, Macaulay, Seeley and Lecky. *One hour.*

5. The Renaissance in Europe. The history of the period 1250–1500 is studied as the close of the middle ages and the beginning of modern times, the chief interest centering in the economic, political, and artistic developments of the age. Considerable reading in con-

temporary sources and in modern works is required. Instruction is by means of lectures. *One hour.*

6. The Medieval and Modern History of Europe. Students meet the instructor in private conference at stated periods to discuss the reading of monographic and encyclopedic works. Assignments are made in accordance with the needs of individuals. This course is intended primarily for candidates for the doctorate, who are prepared to use the French and German as well as the English language. *One hour.*

Courses 1 and 3 are offered during the year 1915–16.

LIBRARY

The Library is under the control of a Library Committee, appointed by the Trustees, of which the President of the University is *ex officio* chairman. The duties of this committee are to advise concerning the arrangement, cataloguing, use of books, and other matters pertaining to the Library not reserved to the Trustees nor otherwise provided for.

Library Committee

President G. Stanley Hall, *Chairman*
President Edmund C. Sanford
Professor William E. Story, *Secretary*

Library Staff

Louis N. Wilson, *Librarian*

Assistants

Edith M. Baker, *Senior Assistant*
Helen J. Elliot, *Cataloguer*
Marian F. Cross
Mary A. Pinkham
Ruth S. Hull
Ethel S. McCoy

The Library building is situated on the corner of Main and Downing streets. The Public Opening of the building was held January 14th, 1904. A full description of the building and of the Proceedings at the Opening will be found in the *Publications of the Clark University Library* for April, 1904 (Vol. 1, No. 3).

The College Library and study rooms occupy the lower floor of the new building, opened in September, 1910, and described in the College Record, July, 1910, Vol. 5, pp. 185–187.

The Library contains over 75,000 bound volumes and pamphlets, and the reading-room receives over 450 journals.

The books are grouped as follows:

A	Works of General Reference	L	Biography
		M	Anthropology
B	Journals	N	Education
C	Mathematics	O	General Science
CD	Math.-Physics	P	History
D	Physics		
DE	Physical Chemistry	R	Political and Social Science
E	Chemistry		Economics
F	Biology, Zoölogy, Botany, Physiology, Neurology	S	English
		T	Modern Languages
G	Geography	U	Classics
H	Pathology	W	Practical Arts
I	Psychology	X	Library Science
J	Philosophy	Y	Art
K	Religious Psychology	Z	Manuscripts

Tuesday and Friday mornings, each week, all books recently added to the library are placed upon a table in the Reference section where they remain for three days. This affords the members of the University and College an opportunity to examine the new books in all departments before they are placed upon the shelves for circulation.

About once a month, during term, by the courtesy of our booksellers, new books are placed for inspection on one of the tables in the Reference section. Any member of the University or College may recommend the purchase for the library of books thus displayed, and such recommendation will receive prompt attention.

All books are classified by the heads of departments and particular attention is paid to the needs of students engaged in research work. The library already possesses a good collection of complete sets of the best scientific periodicals. It makes liberal purchases for individual needs and supplements these by drawing upon the resources of the older and larger libraries through the inter-library loan system. During the past year 543 volumes were borrowed from, and 411 volumes lent to, other libraries. The number of books added each year is about four thousand volumes.

The publications of the Library, edited by the Librarian, and begun in October, 1903, are as follows:

VOL. I.

(1) Bibliography of the Published Writings of President G. Stanley Hall. (2) Bibliography of Child Study for the Year 1902. (3) Proceedings and Addresses at the Public Opening of the Library Building of Clark University, January 1904. (4) Bibliography of Child Study

for the Year 1903. (5) Preparing Manuscript for the Press. (6) Founder's Day, Clark University. (7) Bibliography of Child Study for the Year 1904. (8) The Probable Source of the Plot of Shakespeare's Tempest. (9) Public Opening of the Art Department of Clark University, Dec. 5, 1905.

VOL. 2.

(1) List of Books and Pictures in the Clark Memorial Collection (2) Bibliography of Child Study for the Year 1905. (3) A Few Titles in Child Study. (4) Proceedings at the First Annual Banquet of the New England Association of Alumni of Clark University, and at the Banquet of the Washington, D. C., Alumni Association, 1907. (5) Bibliography of Child Study for the Year 1906. (6) Bibliography of Child Study for the Year 1907. (7) The Outlook for Research (Founder's Day Address, February 1, 1911). (8) List of Papers in the Field of Religious Psychology Presented at Clark University. (9) List of Degrees Granted at Clark University and Clark College.

VOL. 3.

(1) The Relative Legibility of Different Faces of Printing Types. (2) Suggestions for a Model Private Library at Clark College. (3) Bibliographies on Experimental Pedagogy. (4) Further Suggestions for a Model Private Library at Clark College. (5) Bibliographies on Educational Psychology. (6) Representative Books in Child Study. (7) Twenty-Fifth Anniversary of Clark University, 1889–1914.

VOL. 4.

(1) List of Degrees granted at Clark University and Clark College, 1889–1914. (2) Alexander Francis Chamberlain. In Memoriam. (3) Bibliographies on Educational Subjects—No. 3. (4) The Universities and Investigation. Address delivered on Founder's Day, February 1, 1915. (5) Bibliographies on Educational Subjects—No. 4. Experimental and General Pedagogy. (6) Directory of Alumni, Faculty and Students. Clark University.

The books in the Art Department are accessible on application to the librarian, but, by the terms of the Founder's will, they cannot be taken from the building.

All the privileges of the Library are open to all members

of the University, and each member has direct access to every book and journal.

The Library is open from 8 a.m. to 6 p.m. each week day from Sept. 1 to July 1. During July and August it is open from 8 a.m. to 5 p.m. from Mondays to Fridays, and on Saturdays from 8 a.m. to 12 m. The library is closed July 4th, Thanksgiving Day and Christmas Day.

Outside the University are found:

The Library of the American Antiquarian Society, organized in 1812, and containing over 125,000 volumes, accessible to all members of the University.

The Worcester Public Library, containing 600 newspapers and magazines and nearly 200,000 volumes, has, in the past, to some extent supplemented the scientific publications purchased by the University, and all its privileges are accessible without charge.

The Library of the Worcester District Medical Society of about 12,000 volumes, is also free to all members of the University.

LIBRARY RULES

No loud talking is allowed in any part of the Library.

Every book shall be returned at the end of one calendar month from the time at which it was taken out, but may be called in at any time at the discretion of the Librarian.

Current numbers of periodicals shall not be taken out until they have been in the Library ten days.

All dictionaries, cyclopædias, and books of general reference are permanently reserved.

Reserved books and current numbers of periodicals, exempt from circulation, may be taken out after 5 p.m., but must be returned before 9 o'clock the next morning, excepting that such books and periodicals may be taken out Satur-

days at 12 o'clock, and may be kept until 9 o'clock the next Monday morning.

Readers must not write nor make any mark upon any book, manuscript, map, or other property belonging to the Library.

Any breach of the above Rules will involve suspension of the Library privileges until personally restored by the Librarian. All such cases shall be laid before the Library Committee at their next meeting.

ART DEPARTMENT

In his last will and testament the Founder of the University bequeathed

"the sum of $100,000, as an endowment fund for the Art Department of said University, and said sum is to be held and kept sacred and intact as a principal not to be used or expended under any conditions; but the income, interest or proceeds thereof shall be used only in putting and keeping said works of art or others given or obtained for said department in good condition and in taking care of them; and then if there is a surplus of the income of said fund left, I will and direct that it be used in the purchase of additional works of art or of such matters as will add to the usefulness and efficiency of said Art Department."

Under these conditions a large room has been furnished and equipped on the upper floor of the Library Building. Upon the death of Mrs. Clark, those of the Founder's collections that were deemed most suitable for this purpose were arranged and displayed in this room, together with his most valuable books, which, by the conditions of the will, cannot be removed from the building. A complete

catalogue of these books and paintings has been published in the PUBLICATIONS OF THE LIBRARY, Vol. 2, No. 1.

A Curator and Custodian have been appointed by the Board (see page 109) and all the collections are now accessible to visitors. The Art Department is open daily (except Sundays) from 9 a.m. to 5 p.m.

Three portraits and one landscape painting have been added to the collection:

1909. Portrait of the late Carroll D. Wright, President of the Collegiate Department from 1902 to 1909, by the late Frederick P. Vinton of Boston. This painting was awarded the Temple Gold Medal at the 1909 Exhibition of the Pennsylvania Academy of Fine Arts.

1911. Portrait of G. Stanley Hall, President of Clark University, by the late Frederick P. Vinton of Boston.

1913. Landscape painting "Snowing" by Joseph H. Greenwood of Worcester.

1914. Portrait of Edmund C. Sanford, President of Clark College since 1909.

To commemorate the twenty-fifth anniversary of the University the Board of Trustees, early in 1914, commissioned Mr. Victor D. Brenner of New York to prepare a medal to mark that event. The medal is made of bronze and is three inches in diameter. On the obverse is delineated the head of President Hall, and on the reverse a beautiful allegorical group symbolizing the spirit of the University, and the legend,

> "Knowledge is proud that he has learned so much,
> Wisdom is humble that he knows no more."

Scale models of the two new buildings and the University grounds have been made by T. J. McAuliffe and Son of Worcester, under the direction of the architects, Messrs. Frost and Chamberlain.

REGULATIONS

1. All requisitions for apparatus must be made through the Bursar's office upon printed blanks provided for that purpose and signed by a member of the staff.

2. So far as possible, orders for only the kind and amount of apparatus certain to be used during the year shall be placed; nothing shall be ordered for future years, and apparatus for research shall take precedence over that for teaching and illustration only.

3. Requisitions for repairs, furniture, plumbing and work about the buildings must be made through the Bursar's office in writing and with detail, and, when once passed upon, no change involving additional expense can be made in the requisition without the consent of the Finance Committee.

4. No unappropriated rooms and no part of the University grounds shall be used for any purpose, and appropriated rooms shall not be used for other purposes than the stated University work for which they were intended, without previous permission from the office.

5. Unless for special reasons, absence of instructors from their stated exercises or from town for two consecutive week days in term time should be announced at the office, and for longer absence permission should be obtained beforehand.

6. The Trustees desire that no Instructor, Docent, or

Fellow shall enter upon other engagements outside his proper work in the University of a kind or amount likely to lessen his full efficiency for science within the University.

7. Appropriations shall hereafter cover all apparatus and supplies of whatever nature for laboratories, for demonstration or illustration; all metal and carpenter work connected with the scientific activity of each department; and every form of special service. Appropriations, however, shall not hereafter cover orders for books or journals, which shall be submitted to the Library Committee.

8. The several appropriations made to individual instructors and others shall be the full and fixed limit of the liability of the University, to be on no account transcended; and for every excess over the appropriations, from whatever cause, the instructor making the order shall be personally responsible.

9. No order for any purpose shall be paid by the University, whether on appropriations or for general supplies, that has not passed through the Bursar's office.

10. The President, Professors, Assistant Professors and regular Instructors authorized by the Board to do graduate work, together with the Librarian, shall constitute the Faculty of the University. Its meetings shall be called and presided over by its President, or, in his absence, by a Professor whom he shall designate. The Faculty shall elect a Secretary and its records shall always be accessible to the Trustees. Its jurisdiction shall include all matters pertaining to the instruction, conduct and discipline of students, and such other duties as may be prescribed by the Trustees.

11. The President of the University shall make, at the October meeting of the Board, an annual report on the condition of the departments and their work during the year and shall have authority to require and receive from all Instructors and Officers of the University and Library such reports as he may deem necessary. A copy of these reports, including that of the Library, shall be deposited with the Mayor of the City.

12. The University Faculty shall have the oversight of all graduate work and shall recommend for the Master's, Doctor's and all other graduate degrees upon such terms, conditions, and forms as it may determine, and exercise such other functions and responsibilities as are not expressly assigned to the Trustees or to the Collegiate Department.

13. The Custodian of the Art Collection shall have general oversight over its room in the Library Building and its contents, together with their care and use, under the direction and control of the Curator. The Curator shall from time to time submit to the Trustees his recommendations for the purchase of additional works of art from the income of the Art Fund, based on and together with the opinions of experts as to their value and desirability. All such purchases shall be approved by the Board of Trustees, or by such a committee of their members as they shall appoint for that purpose.

14. The President of the University shall make an annual report to the Trustees of the action of the Library Committee, of which he is Chairman, and this report, if approved, shall be filed and preserved.

DEGREES CONFERRED

On June 17, 1915, the University conferred degrees upon the following persons:

MASTER OF ARTS

John Egbert Bishop
Thesis: The conductance of ternary electrolytes in prophyl alcohol

Manmath Nath Chatterjee
Thesis: Anglo-Indian relations

Louis David Covitt
Thesis: Race mixture

Edward Henry Darby
Thesis: Electrical conductance of solutions in bromine

Hermione Louise Dealey
Thesis: A comparative study of college curricula

Wilbur Brooks Dexter
Thesis: On the applicability of the mass action law to solutions of strong electrolytes

Aubrey Augustus Douglass
Thesis: A study of high school organization and curricula

Francis Lee Dunham
Thesis: Somatic development and mental measurement

Robert Newton Elliott
Thesis: Academic freedom in the United States

Joseph Kirk Folsom
Thesis: Organized coöperation in social life

Mae Eleanor Guerin
Thesis: The diplomatic relations between the United States and Chile

Charles Herbert Huffman
Thesis: The Afro-Virginian—His relation to some colonial institutions

Chimaki Kageyama

Thesis: Industrial education in Massachusetts

Charles Bernard Lewis

Thesis: The Etiology of scoliosis

Charles Edward McCorkle

Thesis: The teaching of current events

Early Wesley Moore

Thesis: Home and school coöperation in rural communities

John Cornelius O'Brien

Thesis: The development of trade with Latin-America

George Albert Prohaska

Thesis: Secondary school English

Vance Randolph

Thesis: A preliminary study of dreams

Winifred V. Richmond

Thesis: Sex differences

Bruce Bowman Robinson

Thesis: A study of motor imagery

Samuel Pinckney Schneider

Thesis: The relation of high schools and colleges

Charles Bunsen Shaw

Thesis: Instinct in relation to literature

Gertrude Pauline Smith

Thesis: A study of children's ideals

Joseph Talamo

Thesis: A survey of the Jewish population of Worcester

Adrian Thomas

Thesis: A study of the effects of certain electrolytes and lipoid solvents upon the osmotic pressures and viscosities of lecithin suspensions

Louis Thompson

Thesis: The propagation of transverse waves in a bar

Carl Milton White

Thesis: A study of the vital statistics of Oxford

DOCTOR OF PHILOSOPHY

Lawrence Augustus Averill

Dissertation: The contribution of Pestalozzi

Charles Lewis Brightman

Dissertation: Thermo-elastic relations in steel in the region of recalescence

Burchard Woodson DeBusk

Dissertation: The vital index in relation to development

Elmer Adna Harrington

Dissertation: The dielectric constant of aqueous solutions

William Henry Hayes

Dissertation: Religion as a psychic factor in social development

George Ellis Jones

Dissertation: Training in education

Yoshihide Kubo

Dissertation: Some aspects of recent child study

William Thomas Sanger

Dissertation: A study of senescence

George Samuel Snoddy

Dissertation: An analysis of trial and error learning in the human subject

Harold Frederic Stimson

Dissertation: Elastic hysteresis in metal diaphragms

Raymond Holder Wheeler

Dissertation: An experimental investigation of the process of choosing

Edward Clinton Wilson

Dissertation: The psychology of the story

PUBLICATIONS

A Register and Official Announcement is issued each year in January or February.

In the years 1890, 1891, 1893, and 1902, the annual Report of the President to the Board of Trustees was printed.

A Summer School was held for nine years ending in 1903, and in such years a Summer School Programme was issued.

In July, 1899, the University observed its tenth anniversary, and published the following volume:

Clark University, 1889-1899. Decennial Celebration. 8 x 11 in., pp. 566. Published for the University. Price, $5.00. Contains the lectures delivered by Professors Picard, Boltzmann, Ramon y Cajal, Mosso and Forel at the Decennial Celebration, July, 1899; also reports by the heads of departments on their aims and ideals, with a list of past and present members of the University and the titles of their published papers.

Proceedings of the Child Conference for Research and Welfare. Conferences held at Clark University in the summers of 1909 and 1910. Vol. 1, 1909, 257 p., contains 48 papers on problems relating to child welfare. Vol. 2, 1910, 287 p., contains 34 papers, on similar subjects. The papers in Vol. 1 were reprinted from the Pedagogical Seminary for September and December 1909, but those in Vol.

2, with one exception, have not been printed elsewhere. Price $2.00 per volume in paper, $2.50 in cloth. Louis N. Wilson, Publisher, Worcester, Mass.

In connection with the celebration of the 20th anniversary of Clark University in September, 1909, conferences and lectures were held by the several departments to which distinguished scientists and educators in this and other countries contributed. Two volumes of these lectures have been published with the titles:

Lectures and Addresses Delivered before the Departments of Psychology and Pedagogy in Celebration of the 20th Anniversary of the Opening of Clark University. 175+80 pages. Price $2.00.

Lecturers Delivered at the Celebration of the Twentieth Anniversary of the Foundation of Clark University under the Auspices of the Department of Physics. 161 pages. Price $2.00.

Japan and Japanese-American Relations, pp. xi, 348, New York: G. E. Stechert and Company, 1912, $2.50. Edited by Professor George H. Blakeslee. The volume contains twenty-two of the addresses delivered by the experts, both Japanese and American, who met at the Clark University Historical Conference, November, 1911. Each of the chapters deals with a distinct topic; together they cover progressively the field of what is both most interesting and most vital in the present national and international situation of Japan.

Recent Developments in China, pp. xi, 413, New York: G. E. Stechert and Company, 1913, $2.50. Edited by Professor George H. Blakeslee. These twenty-two addresses, given at the Clark University Conference, November, 1912, by Chinese and Americans who have a recent, intimate and authoritative knowledge of China, present the underlying causes of the Revolution, and the progress and

problems of the Chinese people in government, education, social welfare, industry and religion.

LATIN AMERICA, pp. xii, 388, New York: G. E. Stechert and Company, 1914, $2.50. Edited by Prof. George H. Blakeslee. Twenty-nine addresses given at the Clark University Conference, November, 1913.

These addresses, by well-known authorities upon Latin-American affairs, including a large proportion of citizens of Latin-American countries, present a critical study of the salient features of the life of the American Republics to the south of us, and of their relations to the United States. Among the topics especially emphasized are, the Monroe Doctrine, the Mexican Situation, Trade and Business Relations, Diplomatic Relations, and Education.

JOURNALS CONNECTED UNOFFICIALLY WITH THE DEPARTMENTS

THE AMERICAN JOURNAL OF PSYCHOLOGY. This journal was commenced in November, 1887, and is now edited by G. Stanley Hall, E. C. Sanford, E. B. Titchener (Cornell University), and J. W. Baird, with the assistance of an international board of co-operators. Each volume contains four numbers—issued in January, April, July and October. Besides original articles, a considerable portion of its space is devoted to careful digests of the important literature in its field. Price $5 per volume; single numbers, $1.50. Florence Chandler, Publisher, Worcester, Mass.

THE PEDAGOGICAL SEMINARY. This journal was begun in January, 1891, and is edited by the President of the University with the assistance of William H. Burnham, Professor of Pedagogy. It is an international record

of educational literature, institutions and progress, and is devoted solely to the highest interest of education in all grades, with digests of important literature of all countries. It is the organ of the Educational Department of the University. Each volume contains four numbers—issued in March, June, September and December. Price $5 per volume; single numbers, $1.50. Florence Chandler, Publisher, Worcester, Mass.

Journal of Religious Psychology (including its anthropological and sociological aspects). This journal was begun in May, 1904, and is now in its eighth volume. It is edited by President G. Stanley Hall. The aim of this journal is to publish original material from all parts of the field of religious psychology. Special attention is devoted to the literature of the subject, both books, monographs and articles in current periodicals. It is published irregularly, each volume, of four numbers, containing about 500 pages. Price $3.00 per volume; single copies $1.00. Louis N. Wilson, Publisher, Worcester, Mass.

The Journal of Race Development. This journal was begun in July, 1910 and is edited by Dr. Blakeslee and President Hall with the coöperation of a board of twenty-one contributing editors. It offers itself as a forum for the discussion of the problems which relate to the progress of races and states generally considered backward in their standard of civilization. Issued quarterly, each number containing about 125 pages. Price $2.00 per volume; 50 cts. per number. Louis N. Wilson, Publisher, Worcester, Mass.

UNIVERSITY COLORS

EMERALD GREEN AND WHITE

To be worn in the hood as a green chevron
on a white field